Mass Economy: the Labor Supply and Our Economic Future

A JOINT PROJECT OF:

MassINC
RESEARCH. JOURNALISM. CIVIC LIFE.
10 YEARS

Center for Labor Market Studies

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MassINC wishes to express its thanks to those individuals and organizations whose financial support makes our work possible. Your generosity is deeply appreciated.

MassINC's Mission

The mission of MassINC is to develop a public agenda for Massachusetts that promotes the growth and vitality of the middle class. We envision a growing, dynamic middle class as the cornerstone of a new commonwealth in which every citizen can live the American Dream. Our governing philosophy is rooted in the ideals embodied by the American Dream: equality of opportunity, personal responsibility and a strong commonwealth.

MassINC is a non-partisan, evidence-based organization. We reject rigid ideologies that are out of touch with the times and we deplore the too-common practice of partisanship for its own sake. We follow the facts wherever they lead us. The complex challenges of a new century require a new approach that transcends the traditional political boundaries.

MassINC is a different kind of organization, combining the intellectual rigor of a think tank with the vigorous civic activism of an advocacy campaign. Our work is organized within four Initiatives that use research, journalism and public education to address the most important forces shaping the lives of middle-class citizens:

- **Economic Prosperity** — Expanding economic growth and opportunity
- **Lifelong Learning** — Building a ladder of opportunity through the continuum of learning
- **Safe Neighborhoods** — Creating crime-free communities for all
- **Civic Renewal** — Restoring a sense of "commonwealth"

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About MassINC's Economic Prosperity Initiative

Through the Economic Prosperity Initiative MassINC works to improve the overall economic well being of Massachusetts citizens by pursuing answers to a range of economic questions. Among them: How hard are people working and for what kinds of rewards? How secure are their futures? How healthy are our families? What are the strengths and limitations of state government in promoting economic activity? What is the role of the private sector? And, what are the keys to our future economic success?

MassINC has a long history of work within this initiative. Past research projects include: *The Changing Face of Massachusetts* (2005), *The Graying of Massachusetts* (2004), *Mass.Commuting* (2004), *Mass.Migration* (2003), *The State of the American Dream in Massachusetts, 2002* (2002), *The Changing Workforce: Immigrants and the New Economy in Massachusetts* (1999), *The Road Ahead: Emerging Threats to Workers, Families, and the Massachusetts Economy* (1998), and *Lessons Learned: 25 Years of State Economic Policy* (1998). Articles in *CommonWealth* magazine include: "Blue Collar Blues" (Spring 2004), "Job (Dis)Qualifications" (Fall 2003), "Mass. Production" (Summer 2003) and "Life After Lucent: A region tries to adjust"(Winter 2002).

All of MassINC's research and *CommonWealth* articles are available free-of-charge through our website, www.massinc.org.

Mass Economy:
the Labor Supply and Our Economic Future

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December 2006

Dear Friend:

MassINC is proud to present *Mass Economy: The Labor Supply and Our Economic Future*. This joint project with the Center for Labor Market Studies was made possible by the generous support of The Boston Foundation, Harvard Pilgrim Health Care, Mellon Charitable Giving Program/Alice P. Chase Trust, Merrimack Valley Economic Development Council, Inc., and Serono, Inc.

Our state's highly skilled work force is rightfully a source of pride. This research assesses the health of the state's supply of labor, both now and into the future. A key question is whether the state has an adequate supply of qualified workers to fuel our next round of economic expansion. In recent years, when the national economy began to recover from the recession of 2001, the US labor force expanded, as would be expected. In all of the other New England states, their labor forces have expanded as well in recent years. In sharp contrast, the Massachusetts labor force has not grown at all since 2000, even though the state started adding jobs in 2004.

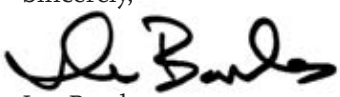
The state's stalled labor force is a result of two very different trends. The first is the continuing out-migration that our state has faced in recent years. Since 2000, more than 200,000 people, on net, have left the Bay State. Relative to our state's population, this level of out-migration is the 2nd highest in the nation, trailing only New York. As other MassINC research has documented, out-migrants tend to be young, well-educated managers and professionals who work in the knowledge economy. The challenge for policymakers is twofold. Strategies to boost job creation are central to stem the future flow of out-migrants. Policymakers should seek ways to make it as easy as possible for people to put down roots in our state, with particular attention to affordability and quality-of-life issues.

The second trend is declining participation rates. A large number of men, especially those with limited education, are neither working nor actively looking for work. From 1989 to 2005, the share of working-age men participating in the state's labor force dropped from 77.7 percent to 72.8 percent. This decline occurred even during strong economic times, suggesting a structural mismatch between available jobs and willing workers. Good-paying jobs for those without college degrees or advanced skills have become considerably harder to find, and more so in our state than in other parts of the nation. A consequence of the New Economy appears to be men with limited education, but still in their prime working years, withdrawing from the labor force. Their withdrawal has contributed to steep declines in the earnings of men without advanced degrees and has also led to rising income inequality in the state. A comprehensive strategy to retrain people for the New Economy, preferably before they lose their jobs, is needed. The human, fiscal, and economic costs of not doing so are enormous.

We are extraordinarily grateful to our partners: Andrew Sum and his colleagues at Northeastern University. In this project, as in all of their work, they have gone well beyond the call of duty, and in doing so, they have broadened and deepened our understanding of the Massachusetts economy and of the critical challenges ahead. On the MassINC team, Dana Ansel, our talented research director has led this important—and complicated—project. We would also like to thank the many reviewers whose critical insights have strengthened this report.

Finally, we would like to thank all of our sponsors who have been generous and enthusiastic partners throughout this project. They have been ideal sponsors, encouraging the authors to go where the data led them. MassINC aims to inject solid, objective research into public policy debates, and to that end, we hope that you find *Mass Economy* a provocative and timely resource. We invite you to become more involved in MassINC, and we welcome your feedback.

Sincerely,



Ian Bowles
President & CEO

Peter Meade
Chairman

Mass Economy: the Labor Supply and Our Economic Future

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EXECUTIVE SUMMARY

The workers of Massachusetts attract businesses from around the nation and the world. With few natural resources, the state's competitive advantage lies with its skilled workforce. Nearly one out of every three adults in Massachusetts (32.9%) has a four-year college degree or higher, compared with a national average of only 23 percent. Massachusetts is the top state in the nation in terms of the share of its working-age residents with a bachelor's or higher degree.

At the same time, Massachusetts has a chronic labor supply problem. It has been most evident during times of economic growth. Within the last decade, labor shortages in some fields have underscored the consequences of an inadequate supply of workers. But, even today, low unemployment rates only serve to disguise the underlying economic problem of workers in short supply. Today, the most recent data indicate that the state's economy is strengthening, outperforming the growth rate of the national economy.[1] The question is: Does the state have a sufficient supply of qualified workers to fuel the state's next round of economic growth?

A growing labor force is often a key indicator of a healthy economy. The availability of jobs and the availability of workers are integrally related. As an expanding economy attracts workers, a sluggish one spurs residents to consider opportunities elsewhere. On the other side of the equation, the availability of workers, especially ones with high levels of education and skills, creates a desirable environment for employers. If employers expand their operations and new employers locate to take advantage of skilled workers, the economy grows, creating more opportunities. Conversely, an inadequate supply of workers tends to make a place less attractive and deters employers from opening new facilities or expanding existing operations.

Drawing on both historical data and the most current information available, this research report raises questions about the health of our state's labor supply.[2] We analyze the causes of the state's stalled labor force, placing recent trends in historical and regional context, in order to highlight a range of policy options. We also look forward, showing how the state's future supply of workers will depend on successfully incorporating more older workers and immigrants into the workforce as well as stemming the high levels of domestic outmigration.

Specifically, we find that the state's labor force has not grown at all over the last five years—the only state in New England that has not seen its labor force grow.[3] Since 2000, jobs and workers

KEY DEFINITIONS:

Labor Force – Includes all people of working age (16 and older) who are working or actively looking for work (Employed people + Unemployed People = Labor Force).

Labor Force Participation Rate – The share of people in a given population subgroup who are either working or actively looking for work.

Out-migrant – A person who moved from Massachusetts to any of the other 49 states or the District of Columbia.

Out of the Labor Force – Those people who are not currently working or actively looking for work. The reasons that people are out of the labor force vary, with some out by choice and others out involuntarily.

Unemployed – Those people actively looking for work and available to accept a job. The precise definition of unemployed varies slightly, depending on the data source.

Working-age Population – All people 16 years of age and older.

have been negatively reinforcing each other in our state. During this time, our labor force grew slightly but then shrunk over the past three years, wiping out all of the gains, and the state is down 150,000 payroll jobs from the peak of the previous economic boom in early 2001. In this, the experience of Massachusetts sharply contrasts with the nation and the other New England states.

A GROWING LABOR FORCE IS A KEY INDICATOR OF A HEALTHY ECONOMY

Over the past five years, all of the other New England states have added workers to their labor force, while Massachusetts has not. The fact that the nation's labor force is growing, as are the resident labor forces of other states in the region, raises important questions about the reasons that Massachusetts is not attracting or retaining workers. Two very different trends help to explain our state's stalled workforce. First, a substantial number of workers have left our state for other states. Previous MassINC research has documented that migrants typically tend to be young, well-educated managers and professionals who fuel the state's knowledge economy.[4] The second trend is that male workers, especially those with limited education, have stopped working in large numbers and are not actively looking for work. In large

KEY FINDINGS:

- From 2000 to 2005, the Massachusetts resident labor force did not grow at all, while the national labor force grew by nearly 5%. On this measure, Massachusetts ranked 48th lowest among the 50 states.
- In the most recent three years (2003-2005), the Massachusetts labor force contracted by 1.7%, and it was the only state in the nation to decline each year during this time period. The nation's labor force expanded by 3.1%.
- Within Massachusetts, the local labor forces declined in Norfolk, Middlesex, and Suffolk counties (-38,600 workers) between 2000 and 2005. The increases in the 10 smaller counties were not enough to offset these losses in Greater Boston.
- Since 2000, the labor force experiences of Massachusetts have contrasted sharply with the rest of New England. The Massachusetts labor force was the only one not to grow, while the labor forces in all the other New England states grew between 4.6% (CT) and 6.0% (VT).
- From 2000 to 2005, the state's working-age population increased by 94,000, or 1.9%, while the nation's increased by 6.4%.
- Massachusetts had the highest share in the nation of its working-age population with a bachelor's or higher degree (32.9%), compared with the national average of 23.4%.
- From 2000 to 2005, the state lost, on net, 233,000 residents to other states. In relative terms, the state lost 3.6% of its 2000 population. Relative to our state's population, this level of outmigration was the 2nd highest in the nation, trailing only New York.
- Since 2000, there has been no increase in the number of in-commuters from neighboring states, indicating that the people who leave for neighboring states are not continuing to work in Massachusetts.
- In 2003-04, the top five destinations for outmigrants were Florida, New Hampshire, Texas, Connecticut, and Rhode Island. The state is primarily losing adults in their prime working years and their families, not retirees. Outmigration was particularly high among 16-24-year-olds and 35-54-year-olds. In 2004, the state lost, on net, 18,000 people with a bachelor's degree or higher.

part, these men's withdrawal from the labor force is a consequence of structural changes in the job market, leaving limited economic opportunities for those without a college degree. This trend is occurring nationally but even more so in our state. These two trends, which have different consequences and policy implications, have combined to severely limit the state's supply of workers.

A Stalled Labor Force

From 2000 to 2005, there was no growth in the state's resident labor force, while the nation's labor force grew by nearly 5 percent. In 2000, the estimated size of the Massachusetts labor force was 3,365,600 workers; in 2005, it was 3,364,500 workers. Moreover, during this time, the number of people who were unemployed increased by 70,000 people, while those who had jobs declined—both are included in the labor force estimates.

What is most striking is the trend over the last three and half years, when the national economy began to add jobs, recovering from the recession of 2001. A growing labor force typically accompanies a recovering economy, as more people enter the job market either working or actively looking for jobs. The nation's labor force expanded by 3.1 percent during this period. In sharp contrast, from 2003 to 2005, the size of the Massachusetts labor force is estimated to have

- Between 2000 and 2004, net outmigration from Greater Boston (Middlesex, Suffolk, and Norfolk counties)accounted for nearly all (99%) of the state's net outmigration, which is associated with the high levels of payroll job losses.
- Between 2003 and 2005, Massachusetts exported 120,000 workers to other states.
- In 1989, 68.9% of the state's population (16 and older) was active in the labor force, meaning they were either working or actively looking for work. This participation rate represented an all-time high. In 2005, the state's participation rate was 66.9%, only slightly higher than the national average of 66.0%. Massachusetts ranked 30th highest in the U.S. on this measure of labor force attachment.
- Each one-percentage-point increase in the state's participation rate would have increased the size of the labor force by slightly more than 50,000 workers in 2005. If we had matched our 1989 participation rate, the state would have had an additional 100,000 workers.
- The decline in the state's labor force participation rate over the last 16 years is almost entirely a result of the behavior of males. The participation rate of women has been roughly constant over this time period. In contrast, the male participation rate dropped from 77.7% in 1989 to 72.8 % in 2005.
- Among men of prime working age, labor force participation declined in each educational attainment group. Since 1990, the steepest drops were among males without a high school diploma (-10.3 percentage points) and those with no post-secondary education (-6.7 percentage points).
- Fewer teens and young adults, especially those who are low-income and/or minorities, are working. For instance, fewer than one-third of young high school dropouts (31.4%) had any type of job. Massachusetts ranked 6th lowest among the 50 states on this measure.
- The participation rate for four-year college graduates in 2005 was 77.6%. If Massachusetts had matched the average participation rate of the top five states, there would have been 90,000 more workers with a bachelor's degree or higher in our labor force in 2005.

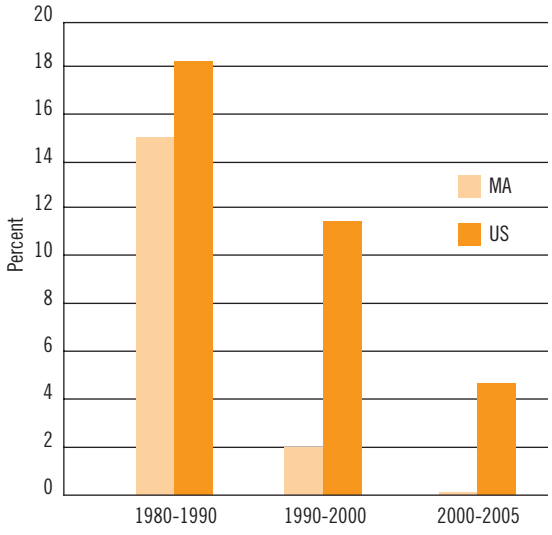
contracted by 1.7 percent. Even as the state started adding jobs in 2004, its labor force has not expanded. This does not bode well for sustaining our recent growth. Massachusetts was the only state in the nation to experience a decline in the size of its labor force over each of the last three years. The most recent data suggest that the state might be heading for its fourth consecutive year of a shrinking labor force, which would be unprecedented for Massachusetts in the post-World War II era.

EVEN AS THE STATE STARTED ADDING JOBS IN 2004, ITS LABOR FORCE HAS NOT EXPANDED

There are differences in local labor force developments within the state. In ten of the state's 14 counties, the local labor forces have grown since 2000. Leading the state were the two small island counties, Nantucket and Dukes County, where the labor forces grew by 10.0 percent and 8.3 percent, respectively. In Barnstable County, the labor force increased by 6.9 percent. In sharp contrast, according to the current estimates, the labor forces in the three counties that approximate Greater Boston—Middlesex, Suffolk, and Norfolk counties—contracted. Together, the labor forces of these three counties shrank by 38,600 workers, a loss large enough to offset the growth in the state's other less populous counties.[5] Even more telling was the decline in the number of employed people in Greater Boston, a consequence of the steep declines in the number of payroll jobs. From 2001 to 2005, the number of employed workers in Greater Boston fell by more than 64,000 people, or nearly 4.5 percent.

ES Figure 1:

Labor Force Growth



To some extent, this is nothing new. Historically, our state has lagged the nation in terms of labor force growth. In the 1990s, the Massachusetts labor force grew by only 2 percent, and the state ranked 47th lowest among the states in its labor force growth. Still, Massachusetts primarily achieved major economic expansion in the 1990s by increasing labor productivity, which is measured as real output per hour of work. By the end of the 1990s, Massachusetts ranked third highest among the 50 states on labor productivity. The prosperity of this decade, however, was not widely shared, and the gains went disproportionately to those families with the highest incomes. An economy based on increasing productivity clearly had success, but it is somewhat risky to be solely dependent on increased productivity for economic success, particularly for achieving a broad-based prosperity.

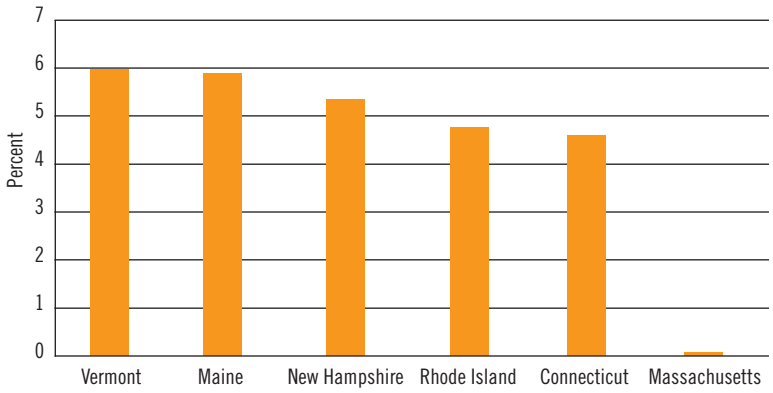
And in the 1990s, Massachusetts was not alone in terms of its slow-growing labor force. Three of the four slowest growing states in the nation were in New England—Connecticut, Massachusetts, and Rhode Island. The other state was our western neighbor, New York. This finding is important in several respects. First, it suggests that what was happening in Massachusetts in the

1990s was part of a larger regional dynamic. In addition, it means that Massachusetts is unlikely to be able to expand its labor force today by attracting workers from neighboring states, since they too are facing similar demographic challenges. In the northern tier of states, young workers will be in short supply over the coming decade.

Since 2000, however, the experience of Massachusetts stands in sharp contrast with those of the other New England states. Between 2000 and 2005, each of the five other New England states expanded their labor forces, ranging from a growth rate of 4.6 percent (Connecticut) to 6.0 percent (Vermont). Note that even Connecticut, which had slower labor force growth than Massachusetts in the 1990s, grew by 4.6 percent. And, in the first five months of 2006, the labor forces have grown everywhere else in New England. The key factor underlying these differences in recent years is the level of outmigration. Other New England states have not had large numbers of people leave their states as Massachusetts has. The high levels of outmigration raise important questions about the attractiveness of Massachusetts as a place to live and work.

ES Figure 2:

Growth Rates of the Resident Labor Force of Each New England State Between 2000 and 2005



The Working-age Population

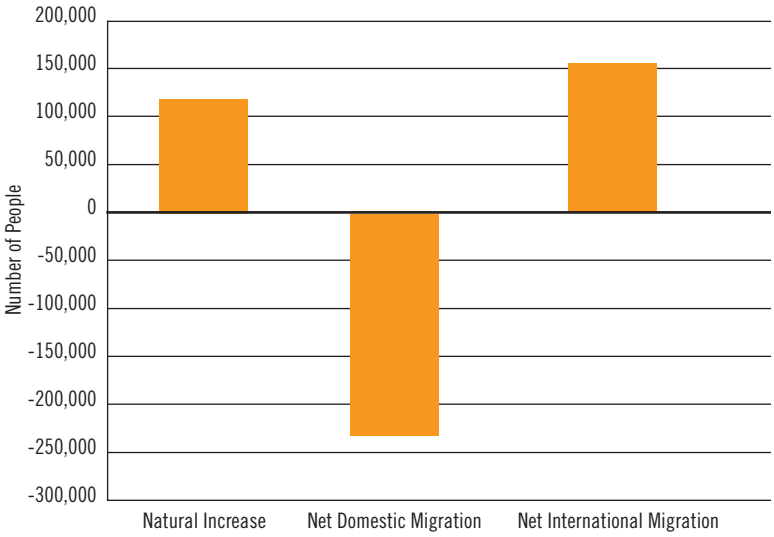
Three factors determine the size of a state's resident labor force: 1) the size of the working-age population (16 years and older); 2) its demographic characteristics, such as age and education; and 3) the rate at which people participate in the workforce. The size of the state's working-age population represents the pool of potential workers. The working-age population in Massachusetts has grown at a slower rate than the nation's since 1960. However, the gap in the relative growth rates of the state and nation has widened over time. In the most recent five years, the state's working-age population increased by 94,000 potential workers, or 1.9 percent. Nationally, the working-age population expanded by 6.4 percent.

The working-age population is ultimately a function of a state's overall population.[6] The growth of a state's overall population is determined by: 1) natural increases, or the difference between the number of births and the number of deaths; 2) net domestic migration, which is the difference between the number of people who move to Massachusetts from other U.S. states and those who leave Massachusetts for other states; and 3) net international migration, which is the difference between the number of immigrants who enter Massachusetts from abroad and those who leave it to live abroad.[7]

On two of these three measures, Massachusetts has experienced net-positive changes. Over the past five years, there have been more births than deaths in Massachusetts, which adds to the state's overall population, and there has also been a net gain of nearly 154,000 immigrants. Since a substantial number of the new immigrants are of working age and the likelihood of immigrant males working is quite high, these new immigrants have bolstered our state's workforce.[8] While some immigrants are highly skilled, pre-

ES Figure 3:

Components of Change in the Population of Massachusetts, 2000-2005



ES Table 1:

Characteristics of Working-Age In and Out-Migrants from Massachusetts by Educational Attainment, 2004

	IN-MIGRANTS	OUT-MIGRANTS	NET DOMESTIC OUT-MIGRATION
No high school diploma	4,765	12,609	-7,844
H.S. diploma/GED	13,768	27,195	-13,427
1-3 years of college	13,917	35,256	-21,339
B.A. degree	29,258	40,754	-11,496
Master's or higher	18,270	24,703	-6,433

Source: 2004 American Community Surveys, public use files.

vious MassINC research, *The Changing Face of Massachusetts*, has documented that many new immigrants have limited education and language skills, and thus face a number of challenges in being able to fully engage in the Massachusetts economy. At the same time, Massachusetts continues to be plagued by large numbers of people leaving the Bay State for other states. Their departure is constraining the size of the state's supply of workers. Between 2000 and 2005, Massachusetts lost, on net, 233,000 people to other states.

Voting with Their Feet: Outmigration

Every year since 1990, Massachusetts has been a net exporter of people to other states.[9] Although the state lost more residents than it gained even at the height of the economic boom, job growth (or decline) is a major determinant of the levels of migration. In recent years, related to the sharp decline in payroll jobs from 2001 to 2003, the state lost a large number of residents. In absolute terms, a loss of 233,000 people is quite significant. But, its significance is even more evident when considered relative to the state's overall population. From 2000 to 2005, 3.6 percent of the state's 2000 population chose to leave our state. Only New York experienced a higher level of net outmigration in relative terms.

Within the state, nearly all (99%) of the net outmigration was from Greater Boston (Suffolk, Middlesex, and Norfolk counties) between 2000 and 2004, according to IRS records. In Greater Boston, the rate of net domestic migration was 9.5 per 1,000 people, which was the third highest rate in the country.[10]

The sheer number of people leaving our state distinguishes Massachusetts from the rest of New England. In three New England states—Maine, New Hampshire, and Vermont—more people chose to move in than to move out. Indeed, New Hampshire gained 40,861 people, boosting its population by 3.3 percent. Although Connecticut and Rhode Island both lost more people than they gained during this period, the sizes of their losses relative to their population were much smaller than in Massachusetts.

In 2004, the top destinations for people leaving the Bay State were Florida, New Hampshire, Texas, Connecticut, and Rhode Island.[11] Many of the people leaving Massachusetts are workers and their families. More children and teenagers left Massachusetts than entered it, meaning that

Massachusetts families with children are leaving the state in sizeable numbers. In the single year 2004, 28,000 people under age 16 left Massachusetts, while 13,630 entered the state, leading to an overall loss of 14,370 people under the age of 16. There were also large losses of people between the ages of 35 and 54 years old. Overall, the state lost 29,033 in that age group in 2004. The state is also losing people at all education levels. Although the state attracts many people with advanced degrees, on balance, it lost 18,000 more people with a bachelor's degree or higher than it gained in 2004.[12]

The impact of the departure of these people on our workforce is substantial. The vast majority of people who are relocating to our New England neighbors are not continuing to work in Massachusetts. Since 2000, because of the large job losses, there has not been an increase in the number of people commuting into Massachusetts for work from neighboring states. In addition, our analysis of out-migrants who were active participants in the state's labor force finds that the overwhelming majority of workers leaving our state (88%) actually left the New England region, and, thus, are unlikely to be available as workers for Bay State companies. Between 2003 and 2005, Massachusetts exported 120,000 workers to other states.

Losing Men: Labor Force Participation

The rate at which people participate in the labor force is critical in determining the size of the labor force. That is, of all the potential workers, how many choose to work or are actively looking for work? We can divide all potential workers into two categories: 1) people who are working or are actively looking for work and 2) people who are out of the labor force. The reasons that people are out of the labor force vary. Some people are out of the labor force by choice and others are out involuntarily. Some do not want to work, but others are so discouraged that they are no longer actively looking for work. Of the former, some are full-time students; others are unable to work because of physical or mental disability. Of those who are out of the labor force, some would not enter the workforce for any wage, but others could potentially be drawn back into the workforce under the right circumstances and with appropriate training and rehabilitation services. The education and skill levels of this population vary considerably. A disproportionate number of them have limited education and skills, but some have advanced degrees.

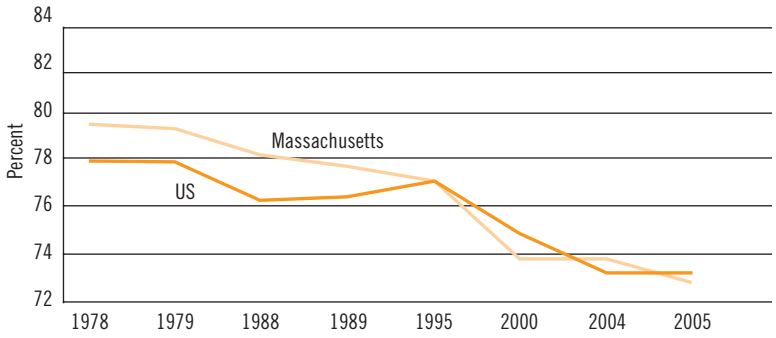
ONLY NEW YORK EXPERIENCED A HIGHER LEVEL OF OUTMIGRATION BETWEEN 2000 AND 2005

Labor force participation in Massachusetts hit an all-time high in 1989 when 68.9 percent of the state's population (16 and older) was in the labor force, working or actively looking for work. During the 1990s, however, the participation rate declined, despite record low rates of unemployment at the end of the decade. By 2000, the participation rate was 67.4 percent, and in 2005, it had declined slightly further to 66.9 percent. This drop in the participation rate, while it might seem small, actually has a large impact on the size of the state's labor force. Each percentage point decrease in the state's participation rate decreases the state's labor force by approximately 50,000 workers. If Massachusetts had matched its 1989 participation rate, the state would have had an additional 100,000 workers in 2005.

The overall participation rate of workers in Massachusetts is slightly higher than the national average, which was 66.0 percent in 2005. Our

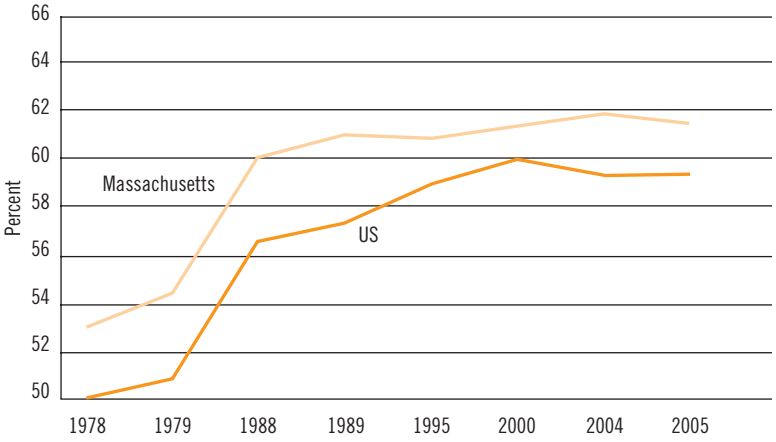
ES Figure 4:

Trends in the Labor Force Participation Rates of Men (16+) in Massachusetts and the U.S. (Annual Averages)



ES Figure 5:

Trends in the Labor Force Participation Rates of Women (16+) in Massachusetts and the U.S. (Annual Averages)



relative ranking, however, has declined significantly over the last 15 years. In the peak year of 1989, Massachusetts ranked 19th highest in the nation in its labor force participation rate. Since then, as the participation rate has declined, so has the state's ranking. In 2005, the state ranked 30th in the nation.

The decline in the state's labor force participation rate over the past 15 years is almost entirely a result of the behavior of males. As more women entered the workforce in the 1970s and 1980s, the participation rate of women increased substantially but has remained roughly stable since about 1989. In 2005, 61.5 percent of all adult women in Massachusetts participated in the state's labor force, either working or actively looking for work. In sharp contrast, the behavior of men has changed considerably over the past 15 years. During the 1990s and continuing today, a substantial number of prime working-age men, especially those with limited education, have stopped working and are not actively looking for work. In 2005, only 72.8 percent of all men in Massachusetts were active members of the labor force, 4.9 percentage points lower than in 1989. While similar trends have occurred across the country, the decline in Massachusetts has been steeper (-4.9 percentage points vs. -3.1 percentage points).[13]

The withdrawal of men from the labor force is related to the state's changing economy. As the state's economy has shifted from a goods-producing to a service-providing economy, these structural changes have had profound impacts on the types of jobs and opportunities available to workers. The demand for workers has grown more rapidly in occupations dominated by college graduates. Consequently, workers with limited education have faced fewer job opportunities, especially in manufacturing, and substantial numbers have left the work force.

The changes in the structure of the job market have been affecting men more than women—even among those with comparable levels of education—partly because men were more entrenched in the blue-collar jobs that have disappeared and also because more of the job opportunities for those with limited education are in occupations dominated by women, such as retail trade and health care services. The participation rate for male high school dropouts dropped by

ES Table 2:

Trends in the Labor Force Participation Rates of 16-64 Year Olds in Massachusetts by Educational Attainment and by Gender, 1990-2000 (Excluding Students)

	MEN			WOMEN		
	1990	2000	PERCENTAGE POINT CHANGE	1990	2000	PERCENTAGE POINT CHANGE
No high school diploma	75.8	65.5	-10.3	53.5	51.9	-1.6
H.S. diploma/GED	89.6	82.9	-6.7	71.4	69.6	-1.8
13-15 years	91.9	88.2	-3.7	79.2	77.8	-1.4
Bachelor's degree	95.5	93.6	-1.9	83.3	81.1	-2.2
Master's or higher degree	96.2	94.4	-1.8	88.5	85.6	-2.9

10.3 percentage points during the 1990s. The withdrawal of men with limited education has implications for family formation, including a rise in single-parent families. In addition, their withdrawal has contributed to higher levels of income inequality and increased dependency on state and federal aid.[14] With the state's economy at its peak in 2000, the continuing withdrawal of men from the state's labor force signals a serious and growing mismatch between workers and jobs. These challenges appear to be the most severe in the state's large urban centers, such as Boston, Springfield, Lawrence, Fall River, and New Bedford.

Still, there are other workers who could potentially be drawn into the state's labor force. The participation rates of adults vary considerably by their age and education levels. Participation rates rise rapidly from the teenage years to the early 20's and then decline from the early 50's onward, with steep declines after age 65. Massachusetts is below average with respect to the participation rates of many age groups and is not a leader in any age group. In particular, among teens, there have been sharp declines in the share of teenagers who were working. There are also substantial gaps in participation rates across income levels and race and ethnicity, with poor and minority youth lagging far behind their more affluent counterparts. Research suggests that these declines in youth employment will likely have long-term effects on their earning potential and future employment, given the long-term importance of early attachment to the labor force.[15]

Adults with higher levels of education are more likely to be active participants in the labor force. In 2005, only 63.6 percent of the state's high school graduates were active participants in the state's labor market, while nearly 78 percent of the state's college graduates were. Still, if we compare the participation rates of Massachusetts residents by education level with those of other states, Massachusetts ranks quite low among all educational subgroups, except for those with a master's degree or higher. Among workers who hold a college degree, Massachusetts ranks 32nd in the country in its rate of participation. In 2005, 77.6 percent of Bay State residents who have a bachelor's degree were either working or actively looking for work, slightly below the national average of 77.9 percent. In some states, such as Minnesota, Iowa, Nebraska, and North Dakota, nearly 85 percent of residents with a bachelor's degree participated in the labor force. This find-

ing raises interesting questions regarding the reasons that Massachusetts residents with a college degree are not participating in the workforce. Although it is not clear how many of these college-educated people would enter the workforce for the right opportunity, a potential opportunity exists for employers to draw some number of college-educated workers who already live in Massachusetts into the labor force.

The State's Future Workforce

In the coming decade, the growth of the state's future workforce depends upon three critical factors: 1) incorporating more older workers into the workforce; 2) incorporating immigrants into the workforce; and 3) stemming the high levels of outmigration.

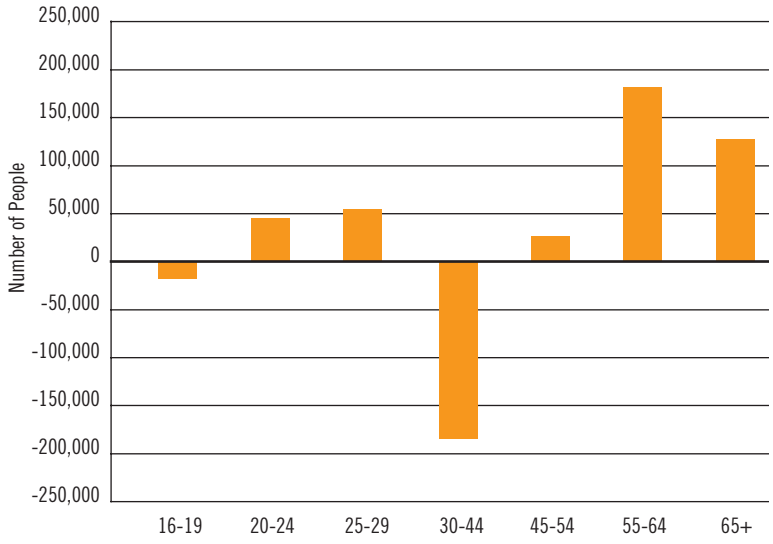
The aging of the baby boom generation (those born between 1946 and 1964) will strongly influence the future age distribution of the working-age population. Over the next decade, the number of people over 55 years old will increase substantially in our state. At the same time, the number of workers in what is considered the "prime working age years" (25-54 years old) is expected to decline. Thus, it appears that any growth in the state's labor force over the next ten years will be concentrated among older workers. In particular, between 2010 and 2015, the graying of the Massachusetts labor force will accelerate further. As previous MassINC research, *The Graying of Massachusetts*, has documented, although the stage appears to be set for older workers to emerge as a key source of labor for employers, a number of challenges still exist in order to capitalize on this opportunity.[16]

Second, immigrants will continue to be an important part of the state's future labor force. The state has been completely dependent on immigrants for its population and labor force growth over the past 15 years, and the next ten years appear to hold more of the same. Consequently, the state's ability or lack thereof to absorb new immigrants into the labor force will have significant implications for the workforce. On the positive side, new immigrants are more likely than the native-born population to be of working-age, and newer male immigrants are also more likely to participate in the workforce. Yet, as has already been noted, a relatively high number of new immigrants have limited education and English language skills, creating a number of challenges for them to fully engage in the Massachusetts economy.

A third factor is the rate of domestic outmigration. If the number of people leaving our state does not decrease, the state's working-age population will shrink and so will the size of the state's labor force. Consider that between 1995 and 2000, on net, Massachusetts exported 21,000 workers to other states. Between 2003 and 2005, Massachusetts exported 120,000 workers to other states. The level of outmigration, however, does

ES Figure 6:

Projected Changes in the Working-Age Population of Massachusetts Between 2005 and 2015



appear to be moderating. In 2003, nearly 50,000 workers left the state. In 2005, that number declined to roughly 26,000 workers. Strategies to reduce outmigration and promote job growth will be critical to the state's future ability to grow its workforce.

Concluding Thoughts

Massachusetts has a chronic labor supply problem. In recent years, its labor force has grown at an anemic rate (in the 1990s) or not at all (2000-2005). With the Massachusetts economy picking up steam, a key question is whether there will be enough workers to fuel the next economic expansion. The stakes are high for the overall economic health of the state, but also for individual workers and their families.

The state's stalled labor force growth is a result of two different trends, which have different causes and affect different groups of workers. The first is the departure of a large number of people from Massachusetts to other states. Since 2000, more than 200,000 people, on net, have left the Bay State. The number of people leaving our state relative to our state's population is the 2nd highest in the nation, trailing only New York. Typically, out-migrants are young, well-educated managers and professionals who work in the knowledge economy.

The high levels of outmigration from Massachusetts raise important questions about the attractiveness of Massachusetts as a place to live and work, especially for those who have choices. Our highly skilled workforce is the state's competitive advantage, and the state can ill afford to lose large numbers of well-educated residents who help fuel the knowledge sector industries, the state's economic engine. These workers will seek the best opportunities. Patterns of migration closely follow the business cycle, with many more people leaving during weak economic times in our state.

The challenge for policymakers is threefold. First, the recent high levels of outmigration are related to the high losses of payroll jobs. The state is still well below the job peak of 2001. Thus, strategies to boost job creation are central to the stem the future flow of outmigrants. In addition, the affordability of housing and quality-of-life issues are important to address. Policymakers should make it as easy as possible for people to lay down roots in our state, which will help deter them from leaving our state in the future. Finally, the state must also focus its attention on improving the skills of current residents of Massachusetts who have strong ties to the state and, thus, are less likely to leave. A greater urgency is needed in the effort to build their skills and education levels to help them share in the state's future economic prosperity, while also helping to fuel the state's economy.

The second trend is the large number of men, especially those with limited education, who are not working and are not actively looking for work. From 1989 to 2005, the share of working-age men participating in the state's labor force dropped from 77.7 percent to 72.8 percent. These declines occurred even during strong economic times and were the steepest among men with limited education. The same trends have happened elsewhere but the declines have been steeper in Massachusetts. As the industrial structure of the state economy has fundamentally changed, good-paying opportunities for those without college degrees or advanced skills have narrowed considerably, and such opportunities are even more limited in our state than in other parts of the nation.

Thus, a by-product of the new economy appears to be men with limited education withdrawing

from the labor force. Many of these men are in their prime working years. Their withdrawal from the labor force has contributed to large drops in their earnings and has also led to rising income inequality in the state. A comprehensive strategy is needed to help workers transition to the new economy. The focus should include both displaced workers and those at risk of being displaced. Research has actually found that intervening before workers become displaced is most effective in helping workers achieve a successful transition. Targeted efforts focused on education and skills, the keys to economic success, are critical. The human and economic costs of not doing so are enormous. Strategies should be developed that link increases in public spending to performance data.

A SUBSTANTIAL NUMBER OF MEN IN THEIR PRIME WORKING YEARS HAVE STOPPED WORKING AND STOPPED LOOKING FOR WORK

More generally, there is a need for a more nuanced understanding of why some people are not actively engaged in the labor force. While disproportionately those with limited education, many people out of the labor force have some college or a college degree. To the extent that employers are seeking workers, there is an opportunity to draw more workers into the labor market. But, the current statistics cannot adequately distinguish between those out of the labor force by choice or those out involuntarily. The declining participation rate among all different types of workers creates an interesting opportunity for Massachusetts to expand its labor force by developing strategies to increase the share of people already living in this state to become members of the workforce. Consider that the participation rate in some states is more than 70 percent, compared with 68 percent in Massachusetts. These states are more successful than Massachusetts in incorporating their residents into the workforce. Some insights could be gained by a closer look at practices of other states that are leaders in incorporating their residents into the labor force and setting ambitious goals for improvement. While this approach is novel, it is also low-cost and the payoff for such a strategy in Massachusetts could be significant.

Finally, there are three other groups of workers that merit attention: older workers, immigrants, and youths. Going forward, the state will be heavily reliant on older workers (55 and older) and new immigrants to expand its supply of labor. These groups offer real opportunities as future workers, but they present different sets of challenges. In the case of older workers, the structure of the workplace is typically not oriented to their preferences such as phased retirement and flexible work schedules. In addition, there are retraining issues for some older workers, particularly those who are dislocated. Because 55-and-older workers will become a considerably larger share of the workforce, these issues will take on a growing importance over the coming decades. The government should convene a summit meeting of public and private sector leaders to plan for this change.

The share of immigrants in the Massachusetts labor force has nearly doubled since 1980. In 2004, 17 percent of the state's labor force consisted of immigrants. While our state attracts many highly educated and skilled immigrants, it is also true that immigrants are more than three times as likely as native-born adults to lack a high school diploma. Significant challenges exist to successfully incorporating immigrants into our

workforce, particularly if they lack the essential English-language skills and formal schooling. In particular, the state's English for Speakers of Other Languages (ESOL) classes reach only a fraction of the immigrants in need of English language classes. In recent years, the waiting lists for ESOL classes have grown considerably, with roughly 20,000 people on waiting lists. The Legislature recently took steps to address this challenge by appropriating significant new money in 2006 for workforce development, Adult Basic Education, and ESOL classes. As taxpayers invest in these efforts, the state should systematically track the "return on investment." It is important for the state to take a leading role in expanding and reforming efforts to teach immigrants to speak English. But, at the same time, meeting this challenge will require more than simply increased government spending on ESOL classes. This long-term issue requires a comprehensive public/private strategy.[17]

For youths, we need to continue our efforts at helping them understand the changing education and skills requirements of the economy. Expanding internship and summer job opportunities will also help them develop their work readiness skills. Early attachment to the labor force is critical to their long-term economic success. As the state's future workers, there is a clear need for workforce development policies that boost employment opportunities for disadvantaged teens and young high school dropouts.

The quality and quantity of the state's workforce is key to the state's future economic health. A highly skilled workforce is the state's competitive advantage, but having a sufficient number of workers is critical as well. Massachusetts is a leader in the education levels of its workforce, but we are losing workers overall, including well-educated young people. The loss of workers to other states and the withdrawal of prime working-age men from the labor force have reduced the future economic competitiveness of the state and heightened economic inequality. Ensuring an adequate supply of labor and broadening economic opportunity in our state will require several different strategies geared toward the challenges documented in this research report. The current state of Massachusetts' labor supply does not have to be indicative of its future labor supply. The time to address these challenges is now, before we are faced with large numbers of job vacancies, threatening the economic vitality of the state.

Endnotes

1. See "The Benchmarks Bulletin," *Mass Benchmarks*, October 31, 2006 and Gavin, Robert, "Mass. Economy Grows 3.4%, twice US Rate," *The Boston Globe*, October 28, 2006.
2. This research is based on a variety of national and state data sources, including the decennial Censuses, the monthly Current Population Surveys (CPS), the American Community Surveys (ACS), and the Local Area Unemployment Statistics (LAUS) program. These surveys use similar but not identical definitions of labor force activity. For instance, the decennial Census' definition of the unemployed differs slightly from that of the Current Population Surveys. Because of these differences, the numbers vary slightly, depending on the source, but the overall findings are not affected by these conceptual differences.
3. This estimate is based on the Local Area Unemployment Statistics (LAUS) program, which is considered the official labor force statistics for states. According to the Current Population Survey (CPS), the state's labor force grew slightly, adding 43,000 workers over this five-year period. While the precise numbers may vary, the larger trend of very limited labor force growth is accurate.
4. See Nakosteen, Robert, Michael Goodman, Dana Ansel, et. al. *Mass.Migration*. A joint project of MassINC and University of Massachusetts Donahue Institute, 2003.
5. It is possible that the Suffolk County labor force estimate might be revised at a later point, reflecting the revised City of Boston population estimates. While the precise numbers might change, the overall

trend will not change. The upward revised labor force estimates would not be enough to change the finding that the state's labor force contracted over the last three years.

6. Recently, the U.S. Census Bureau revised its population estimates for the City of Boston. Instead of losing population from 2000 to 2005 as had been previously reported, the City of Boston is estimated to have grown by 1.3 percent. This revised estimate does not directly affect the findings presented in this research, because they are based on different data sources and use different methodologies. At a later point, the Census will revise the state population numbers. But, while the specific population estimates will change modestly, the overall trends will not change substantively. Massachusetts ranks near the bottom of the nation in terms of population growth in recent years.

7. From 2000 to 2005, the state's overall population is estimated to have increased by slightly under 50,000 people or 0.8 percent. During this time, the population under 18 is estimated to have declined by 2.8 percent. The drop in the under 18 population is a result of the outmigration of families with children combined with the state's low fertility rates. In 2003, the fertility rate among women ages 15 to 44 in Massachusetts was 57.2 babies per 1000 women, well below the national average of 66.1. These low fertility rates are not completely surprising given the high levels of education that tend to correspond with smaller households, but they do represent another challenge for the state in terms of growing its population and its future labor force.

8. The likely increase in the number of illegal immigrants has also had some adverse affects. Although the hiring of undocumented workers is illegal under national labor law, the absence of active enforcement increases willingness of employers to hire them. The presence of undocumented immigrants, including many with limited education, increases the supply of low-skilled workers and has adverse effects for native-born workers who also have limited education. In addition, their presence shifts some of the economic activity to an underground economy, which depletes the state's resources and denies workers adequate protection under existing labor laws.

9. See *Mass.Migration*, 2003.

10. These estimates of outmigration are based primarily on IRS tax returns and are not affected by the revised population estimates for the City of Boston. The IRS records have trouble capturing students and are biased toward overcounting out-migration. Nonetheless, even after estimating the effects of the student population, the levels of outmigration from Greater Boston are substantial.

11. In 2004, there were a few notable changes in terms of the destinations for outmigrants compared with the findings of earlier MassINC research *Mass.Migration* (2003). Similar to the findings of *Mass.Migration*, Florida and New Hampshire were overwhelmingly the top two destinations of choice. In contrast, in 2004, a sizeable number of outmigrants moved to Connecticut and Rhode Island. From the period 1990 to 2002, Massachusetts actually gained, on net, more people from those two states than it lost. In the 1990s, California, Georgia, and Arizona were popular destinations, while these states are not among the top ten destination states in 2004. It is normal to see some fluctuations in the destination states.

12. The impact of the outmigration of college-educated people on the state's labor force is even greater than this number implies, because a substantial fraction (40%) of recent in-migrants with college degrees came to Massachusetts to attend graduate school and are not employed. In contrast, the vast majority of out-migrants who have a college degree are not students but are working in their new state of residence. However, neither the ACS data nor the IRS records do a good job at capturing the movements of undergraduate students. Both are biased toward overstating net outmigration.

13. For more on low rates of labor force participation, see: Katharine Bradbury. "Additional Slack in the Economy: The Poor Recovery in Labor Force Participation During this Business Cycle." *Public Policy Briefs*, Federal Reserve Bank of Boston, No. 05-2. She finds that, nationally and in our state, the labor market has been slow to recover from the last recession. Labor force participation rates relative to the business cycle have not recovered as much as would be expected based on past business cycles. Thus, both the employment and unemployment rates have overstated the strength of the recovery, given the lower participation rates and the existing slack in labor supply.

14. There has been a large increase in the number of disabled people over the last six years. The increase is primarily among prime-age working people, who are disproportionately men, and an overwhelming number of them have limited education. Khatiwada, Ishwar, Andrew Sum, Joseph McLaughlin with Sheila Palma and Paulo Tobar. *The Labor Force Behaviors, Employment and Earnings Experiences, and Labor Market Problems of the Disabled Working-Age Population in Massachusetts, New England, and the U.S. in 2003 and 2004*. Center for Labor Market Studies, Northeastern University. Prepared for The Commonwealth Corporation and Massachusetts Rehabilitation Commission, June 2006.

15. Sum, Andrew, Neeta Fogg, Garth Mangum. *Confronting the Youth Demographic Challenge: The Labor Market Prospects of Out-of-School Young Adults*. Sar Levitan Center for Social Policy Studies, Johns Hopkins University, Policy Issues Monograph 00-01, October 2000.

16. For instance, older workers are more expensive to employ for a number of reasons. Their earnings tend to be higher and the cost of benefits, particularly health insurance, also rises with age. In addition, the structure of the workplace is often not geared towards the preferences of older workers. Finally, it is an open question whether older workers will have the skills needed for the future jobs. On the positive side, they are the only age group in Massachusetts that has increased its rate of labor force participation over the past five years. For more on these issues, see Munnell, Alicia, Kevin Cahill, et al. *The Graying of Massachusetts*. A Joint Project of MassINC and Center for Retirement Research at Boston College, 2004.

17. See *The Changing Face of Massachusetts* for more specific recommendations.

I. INTRODUCTION AND OVERVIEW OF THE REPORT

Labor market developments at the national, state, and local level have a number of important consequences for the economic well-being of workers, their families, their communities, their states, and the nation.[1] The bulk of the annual incomes received by most non-elderly, adult individuals and families are generated through their active labor market participation. The labor force behavior of individual workers, the utilization of the hours of labor that they offer to the labor market, and the compensation that they receive for their labor will determine their annual earnings. The combined annual earnings of family members are the critical determinant of their annual incomes and their purchasing power over goods and services. Limited labor force attachment, low rates of utilization of the hours of labor offered by workers, or low compensation for hours worked will reduce the annual earnings and incomes of workers and their families, thereby increasing the incidence of income inadequacy problems and the degree of inequality in the family income distribution. Careful tracking and assessment of on-going labor market developments, thus, become important to economic policymaking, human resource planning, and human resource program management in both the private and public sectors of the economy.[2]

The economic living standards of the residents of the nation and each state are critically influenced by the aggregate level of real output; i.e., the nation's Gross Domestic Product (GDP) or the state's Gross State Product (GSP). The annual level of real output of a state's economy, in turn, is influenced by the fraction of the working-age population that is attached to the labor market, the intensity of their labor market attachment (hours of employment) during the year, and the efficiency of labor in producing output per hour of work; i.e., labor productivity.[3] As Adam Smith noted in his classic economic treatise *The Wealth of Nations* more than 200 years ago, the economic well-being of any nation will be dependent on the fraction of its population that is engaged in productive economic activity and the efficiency with which they can produce output while they are employed.[4]

The human capital of a country's working-age population, i.e., its educational attainment, literacy, math, and science proficiencies, occupational skills, and its work experiences have been found to have significant effects on the economic growth rates of nations across the globe.[5] These human capital investments of individuals tend to boost their labor force attachment, their employability, and their labor productivity. Both the quantity and quality of labor will, thus, influence the future growth path of a state's economy. Our future living standards will be determined by the ability of the state to produce higher levels of Gross State Product.

THE QUANTITY AND QUALITY OF THE LABOR SUPPLY WILL INFLUENCE THE FUTURE OF OUR STATE'S ECONOMY

Given the importance of growth in both the quantity and quality of labor for a wide array of economic outcomes in the state, knowledge of on-going labor force developments in Massachusetts is indispensable for economic development and workforce development policymaking and program planning. For Massachusetts, there have been a number of troubling developments in the labor force in recent years. First, the resident labor force of the state experienced very little growth

(2%) during the decade of the 1990s due in large part to a decline in the labor force attachment of working-age residents, especially males. Strong payroll job growth in the mid to late 1990s pushed the overall unemployment rate of the state down to record lows by the end of the decade and contributed to growing labor shortages in industries and occupations.[6] Between 2000 and 2005, the estimated size of the state's labor force has been basically constant, with growth in the number of labor force participants between 2000 and 2002 offset by declines over the past three years despite a renewal in payroll job growth starting in 2004. Understanding the sources of the limited labor force growth during the 1990s and the stagnation of the labor force since 2000 is one of the primary objectives of this study.

To fully understand changes in the size of the state's resident labor force over time, one must analyze both a wide array of demographic developments and shifts in the labor force behaviors of different demographic and socioeconomic subgroups of the working-age population. Trends in the aggregate size of the working-age population (16 and older) and its age/gender/nativity status/educational characteristics will have an important influence on the growth of the resident labor force.[7] The labor force participation rates of age/gender/educational groups continue to vary in many cases quite substantially; thus, changes in the demographic composition of the working-age population will have important consequences for labor force growth and the human capital characteristics of the labor force.

During the 1990s, the growth of the state's working-age population slowed considerably partly as a result of high levels of domestic out-migration. In *The Road Ahead*, concerns about the high levels of domestic out-migration were raised, including their adverse effects on the growth of the resident labor force and loss of young families with children.[8] Rising costs of home ownership, primarily driven by sharp rises in the ratios of home prices to household incomes in the state, were making Massachusetts a high cost of housing state at the end of the 1990s, increasing the cost of living, especially for families aiming to be first time home buyers. National research had shown that states with relatively high homes prices were more likely to experience higher levels of out-migration and receive fewer in-migrants from other states.[9] In *The State of the American Dream in Massachusetts,* the ratio of median home prices to median household incomes in Massachusetts during 2000 was found to be the third highest in the country, exceeded only by California and Hawaii, and this housing affordability variable was found to significantly reduce home ownership rates in the state.[10]

Net out-migration from the state slowed during the boom years of the late 1990s and 2000, but then moved to higher levels during the first two years of the current decade as state labor market conditions deteriorated. In *Mass Migration*, these outflows of state residents to other states across the country were identified and renewed concerns about their adverse impacts on the state were raised.[11] The state was becoming increasingly dependent on new immigrants to allow the population to grow and to achieve labor force growth. *The Changing Face of Massachusetts* documented the increasingly important role played by foreign immigrants in generating population and labor force growth in the 1990s and the early years of the current decade, but also noted a number of educational and workforce challenges that were being posed by the increasing presence of these new immigrant adults.[12] The labor market success of many immigrants in both Massachusetts and the U.S. was found to be

critically influenced by their educational attainment and their self-reported English-speaking proficiencies.[13]

The population of Massachusetts was estimated by the U.S. Census Bureau to be growing very slowly during the 2000-2003 period, with net domestic out-migration rising throughout this time period and offsetting increases in the population due to natural increases and net inflows of immigrants from abroad. A public opinion survey on the quality of life in Massachusetts conducted by Princeton Survey Research for MassINC in early 2003 yielded a number of disturbing findings.[14] Findings revealed that up to one-fourth of Massachusetts residents were considering moving out of the state "if given the opportunity to do so". The proportions of residents willing to move out were even higher among those classifying themselves as "working class" and those who were more dissatisfied with the quality of life in the state.

Since the release of the above survey results in 2003, more state residents appear to have acted on those threats to move out of the state. During both 2004 and 2005, the resident population of the state was estimated by the U.S. Census Bureau to have declined modestly.[15] Massachusetts was the only state in the nation to experience such back-to-back reductions in its population. High levels of domestic out-migration in 2003, 2004, and 2005 were the key factors in reducing the size of the population. A recent survey conducted by the *Boston Globe* revealed that the vast majority of those who left the state do not plan to return to Massachusetts.[16] Out migrants appeared to be satisfied with their jobs and their housing in their new locations. A number of demographers and urban economists have attributed recent high levels of domestic out-migration to high costs of housing and a weaker job market in Massachusetts, but detailed evidence on who leaves and who comes into the state and their impacts on the state labor force is missing.[17]

To improve our understanding of the influence of these demographic developments on the state's labor force, this study will utilize a variety of data sources, including the recent American Community Surveys (ACS) for 2003 and 2004, to identify the demographic and socioeconomic characteristics of domestic in-migrants into the state and out-migrants from the state in recent years and their labor force behaviors.[18] The ACS surveys and the Current Population Surveys (CPS) also will be used to track the inflows of new foreign immigrants into the state, their demographic/human capital traits, and their labor force behaviors. The impacts of domestic in and out-migrants and new immigrant inflows on the size and demographic composition of the resident labor force of the state will be analyzed.

STATE RESIDENTS APPEAR TO HAVE ACTED ON THREATS TO MOVE OUT OF THE STATE

The growth of a state's resident labor force over time is also influenced by the labor force participation behavior of its working-age residents. Changes in both the incidence and intensity of labor force attachment during the year will generate changes in annual average labor force participation rates. If a higher share of the working-age population chooses to work at some time throughout the year or to work more weeks and months during the year, the participation rate will rise and the size of the civilian labor force will grow.[19]

Among the key factors driving the high rate of growth of the Massachusetts labor force during the 1960s, 1970s, and 1980s was the continuous rise in the participation rate of women. By 1990,

however, the participation rate of women had peaked and the male participation rate soon resumed its long term decline. As a consequence of these two developments, the state's overall labor force participation rate fell in the 1990s, holding down the growth of the resident labor force. Males in Massachusetts contributed very little to the growth of the state's labor force in the 1990s (only 3 percent of the net increase),[20] one of the lowest ratios in the entire country. More detailed knowledge of the nature and sources of the labor force participation declines among men in the 1990s and trends in participation rates of working-age males in the state since 2000 would be helpful in understanding the absence of labor force growth over the past five years. Such information is also critical to identifying the potential role of workforce development policies in reversing this trend toward stagnation and decline.

THE STATE'S OVERALL LABOR FORCE PARTICIPATION RATE FELL IN THE 1990S

An analysis of the labor force behavior of other key demographic groups, including age, educational attainment, nativity status, income, and disability groups is also critical for both interpreting the absence of growth in the state's labor force over the 2000-2005 period and developing appropriate public policy responses. Nationally, there have been very steep declines in the labor force participation rates and employment rates of teens since 2000 and more modest, but substantive declines in the participation rates of young adults (20-24), especially those with no post-secondary schooling.[21] The employment rate of the nation's teens in 2004 was a post-World War II record low. High school students and young high school dropouts in Massachusetts also were participating in the labor force at very low rates in recent years, with teens from low income areas and economically disadvantaged families faring the worst.[22]

Other groups in Massachusetts also appear to be facing serious obstacles to their active participation in the labor market. High school dropouts, especially males, seem to be far less attached to the labor market in recent years. The heads of poor/near poor households and families in Massachusetts and New England have been found to have relatively low attachment to the labor force, thereby reducing their earnings from labor market activity, increasing the severity of their income inadequacy problems and their dependence on cash and in-kind transfers (rental subsidies, food stamps, Medicaid) to support themselves and their families.[23] Nationally, since 2000, there has been a several million increase in the number of working-age persons (16-54) reporting no work during the year due to illness or disability, and the number of individuals receiving disability payments under the Social Security Disability Income Program (SSDI) or the Supplemental Security Income program for the Disabled (SSI) has risen by a similar amount.[24] In Massachusetts, during 2003-2004, there were 509,000 adults (16-74 years old) who reported that they had one or more physical or mental disabilities.[25] Only 36 percent of these disabled adults were active in the labor force in 2003-2004, and only 30 of every 100 were employed, either part-time or full-time. The lack of employment among this group considerably increased the likelihood that they would be poor or near poor. Labor underutilization problems also were quite severe among this group of disabled adults, reducing their contribution to the Massachusetts economy.

A number of forthcoming demographic developments in Massachusetts also have impor-

tant implications for the growth of the state's labor force and its age composition. The state's population is aging and will continue to do so as the baby boomers continue to enter their pre-retirement and retirement years in large numbers.[26] The first members of the post-World War II baby boom generation became 59 years old in 2005, and the 55-74 year old population group is projected to account for the bulk of the growth in the state's working-age population over the 2005-2015 period. At the same time, the number of teens will be declining and the baby bust generation will be entering their late 30s and 40s over the decade, pushing down the number of 35-49 year olds in the state's population. What impacts will these recent changes in the size and age composition of the state's working-age population and the forthcoming changes in the age/gender distribution of the working-age population have on the future growth and age/gender composition of the resident labor force? To answer these key questions, we will project changes in the future size and age composition of the state's resident labor force over the 2005-2015 period based on several different scenarios regarding the future labor force participation behavior of the state's population by age group and gender.

An Overview of the Report's Contents

Proper interpretation of labor force data is dependent on knowledge of its sources and the concepts/measures underlying the data. Since all labor force estimates are based on particular data sources and a set of concepts and measures underlying these data, our report will begin with a brief overview of the data sources used to generate all of the estimates of the aggregate size, demographic/human capital characteristics, and geographic distribution of the resident labor force of Massachusetts appearing in this study. A variety of data sources, including the decennial Censuses of Population and Housing, monthly Current Population Surveys, and the more recent American Community Surveys, were used to conduct the analyses of the labor force that appear in this study. The labor force concepts and measures underlying the estimates from each of these data sources are quite similar but not identical. The key differences between the labor force and population concepts and measures underlying these different data bases will be discussed.[27]

Trends in the aggregate size and gender composition of the Massachusetts labor force from 1970-2000 and from 2000-2005 then will be described and assessed. Comparisons of the findings on labor force growth within Massachusetts over these different time periods will be made with the U.S., all other states, and individual New England states. Key demographic developments and changes in labor force participation behavior underlying the slowing of growth in the Massachusetts labor force during the 1990s and the absence of any labor force growth over the past five years (2000-2005) will be identified. Changes in the size of the labor force across geographic areas of the state from 2000 to 2005 also will be described.

The analysis of trends in the aggregate size and gender composition of the Massachusetts labor force will be followed by a more detailed examination of changes in the size of the working-age population of the state over the 1960-2000 period and the more recent 2000-2005 period. Demographic forces play a very substantial role in driving growth and decline in the resident labor force over time. Again, changes in the working-age population of the state will be compared to those taking place in the U.S. over similar time periods. Population developments in Massachusetts over the 2000-2005 period will be examined

in more detail, including the changing age composition of the population, the growth and decline of the population across geographic areas of the state, and the sources of change in the resident population. These sources of population growth and decline include natural increases (births-deaths), domestic in and out-migration , and net international migration. The annual sizes of the flows of domestic in and out-migration in Massachusetts over the 2000-2005 period will be identified together with a listing of the states from which we gain net migrants and those to which we lose population. The number of states for which we are net losers unfortunately far exceed the states for which we are net gainers. The age and educational characteristics of the domestic in and out-migrants in recent years will be examined, and the impacts of these large net out-migration flows on the size and age distribution of the resident labor force will be assessed. The role of foreign immigration in influencing the size and nativity status of the working-age population of the state will be examined. The demographic analysis will conclude with a review of the educational characteristics of the state's working-age population and its resident labor force. Comparisons of the findings for Massachusetts with those of all other states across the country in 2003 will be made. On most key educational measures for both the working-age population and the labor force Massachusetts will be found to be a national leader.

The growth of the state's resident labor force and changes in its demographic/human capital composition are also influenced by the labor force participation behavior of its working-age population and key subgroups of that population. Trends in the overall labor force participation rates of the state's working-age population over the 1978-2005 period will be examined, and findings on participation trends for Massachusetts will be compared to those for the nation and the other 49 states. The comparative ranking of Massachusetts' participation rates among the 50 states over time will be identified. Given substantial variations in their labor force behavior over time, the participation rates of men and women in Massachusetts will be analyzed separately. The declining rates of labor force participation among men will be carefully examined. Analyses of the labor force participation behavior of a wide variety of age groups, educational attainment groups, nativity groups, the poor/near poor, and the disabled adult population also will be presented. Massachusetts' recent rankings among the 50 states with respect to the labor force participation rates of these various demographic and socioeconomic subgroups will be presented. We also will conduct a number of labor force simulations, estimating the increase in the Massachusetts resident labor force in recent years (2004, 2005) that would have taken place if the labor force participation rates of these various demographic and socioeconomic subgroups had been equal to the average of the top five or ten performing states in the nation. The magnitudes of these simulated increases in the resident labor force from strengthening the labor force attachment of key subgroups will be carefully assessed, and the potential economic, fiscal, and social benefits from doing so will be identified.

The question of whether state and local political leaders and economic policymakers should be concerned about recent population losses, high levels of domestic out-migration, and the absence of labor force growth since 2000 will be raised and appraised. Arguments on both sides of the debates will be presented, and empirical evidence on the statistical relationships between population change, labor force change, and an

array of economic output, employment, and labor productivity measures across states over two time periods (1989-99 and 2000-2004) will be presented. The public policy implications of the findings of this analysis will be briefly discussed.

Our analysis of past and present trends in the aggregate size and demographic composition of the resident labor force of Massachusetts will be supplemented by an analysis of likely trends over the coming decade. The projected outlook for future labor force growth in the state and its age composition will be presented. Using state resident population projections by age group and gender from the U.S. Census Bureau for the time period 2005-2015 and several sets of assumptions about the course of future labor participation rates of Massachusetts residents by gender and age group, we will generate projections of the future size and age/gender composition of the Massachusetts labor force in 2010 and 2015. The impacts of the aging of the baby boom generation on the graying of the labor force will be highlighted. The final section of the study will provide a summary of key findings of the labor force and demographic analyses and assess their implications for future economic development, education, housing, and workforce development policies in the Commonwealth.

Sources of Data on the Massachusetts Labor Force

The estimates of the size and demographic/socioeconomic characteristics of the working-age population (16 and older) and resident labor force in Massachusetts appearing in this monograph are based on a variety of national and state data sources. The decennial Censuses of Population and Housing from 1960 through 2000 were relied upon to produce historical estimates of the size and growth in the state's resident labor force over this 40 year period and to track the sources of labor force change in the 1970s, 1980s, and 1990s. Both a wide array of published data from the U.S. Census Bureau and the public use micro-data files from the decennial Censuses were used in conducting this analysis.[28] A second major source of data on the Massachusetts labor force, especially for the intercensal years, is the monthly

THE AGING OF THE BABY BOOM GENERATION WILL IMPACT OUR LABOR FORCE

Current Population Surveys (CPS). The CPS household surveys are conducted monthly by the U.S. Census Bureau for the U.S. Bureau of Labor Statistics. A representative sample of households is interviewed in each state. Annual findings from the CPS surveys for states and large metropolitan areas are published by the U.S. Department of Labor in a series titled *Geographic Profile of Employment and Unemployment*.[29] The U.S. Bureau of Labor Statistics also makes available to researchers public use data files containing micro-records from the monthly CPS questionnaires. We have used the CPS micro-data files for the years 1999 through 2005 to analyze labor force developments in the state over the past seven years and to compare Massachusetts' findings with those for all other states across the nation.

A third set of data on the labor force behavior of Massachusetts residents is that from the American Community Surveys (ACS) for calendar years 2003 and 2004.[30] The ACS survey is a large scale national household survey conducted by the U.S. Census Bureau that utilizes a questionnaire quite similar to the long form questionnaire used in past decennial censuses. The ACS surveys were designed to take the place of the long form questionnaires in the decennial

Census. During 2003 and 2004, ACS questionnaires were completed by approximately 12,600 households across the state of Massachusetts and by nearly 600,000 households across the nation. Among the advantages of the ACS survey data are the availability of data on both the labor force status of respondents and their household incomes. The joint availability of these variables enables us to examine more fully the labor force behavior of teens, young adults, older workers (55+) and family heads by their poverty/near poverty and low income status.[31] The findings of the ACS surveys on the labor force participation rates of age/gender subgroups of the population also will be used to simulate the impacts on the size of the Massachusetts labor force from raising the participation rates of residents in these different demographic subgroups to those of the top ten performing states in the country.

The fourth and last set of findings on the size and geographic distribution of the resident labor force of the state are based on the estimates of the Local Area Unemployment Statistics program known by its acronym (LAUS). The LAUS data are generated on a monthly and annual average basis by the Massachusetts Division of Unemployment Assistance under a federal-state cooperative statistical program with the U.S. Bureau of Labor Statistics. The LAUS findings on a statewide basis are linked to those from the CPS household surveys. The LAUS program produces estimates of the aggregate size of the resident labor force for the state as a whole as well as for metropolitan areas (NECTA areas and divisions), counties, and cities and towns.[32] The LAUS program does not, however, provide any information on the demographic, socioeconomic or occupational characteristics of the resident labor force or of the employed and unemployed members of the labor force.

Labor Force Concepts and Measures

This research study is primarily focused on the changing size and demographic/human capital composition of the Massachusetts resident labor force and the demographic developments and labor force behaviors underlying these changes in recent years. Knowledge of the labor force concepts and measures underlying these estimates is, thus, important for interpreting the findings. As noted above, the labor force data are generated by several different surveys that utilize very similar but not identical labor force concepts. For example, *the resident civilian labor force* in the decennial Censuses[33] include all employed and unemployed persons in the state regardless of where they work or whether they are living in the state permanently or temporarily. In the decennial Census, the CPS, and ACS surveys, a resident of Massachusetts who works outside of the state is considered a member of the Massachusetts resident labor force while a New Hampshire resident who commutes to a job in Massachusetts is considered a member of the resident labor force of New Hampshire. We will examine the evidence on changes in the commuting of workers from other states into Massachusetts to determine whether the absence of resident labor force growth over the past five years may be due in part to increased reliance of employers on in-commuters from neighboring New England states and New York.

The decennial Censuses include both temporary and permanent residents in the labor force statistics for Massachusetts. For example, a college student from New Jersey attending Boston University or Northeastern University who was working in Boston at the time of the 2000 Census would be counted as a member of the resident labor force of Massachusetts. In contrast, the CPS survey treats college students temporarily living away from home as a resident of their home

state rather than the state in which they are attending college. Thus, the above hypothetical college student would be treated by the CPS survey as a resident of New Jersey not of Massachusetts.[34] The American Community Surveys only cover residents of private households. In both the 2003 and 2004 surveys, residents of group quarters, such as college dormitories or fraternities, were not included in the survey universe. They will be included in future years.

The civilian labor force consists of all working-age individuals (16 and older) who were either employed or unemployed. The employed in the CPS household survey and the ACS surveys are those persons who in the previous calendar week met one of the following three criteria:

- Worked for 1 or more hours for pay or profit in the reference week.[35]
- Had a job from which they were temporarily absent due to such reasons as vacation, a temporary illness, weather, or an industrial dispute at the work place.
- Worked in a family owned business without pay for 15 or more hours.

The unemployed in the CPS survey are those who meet each of the following criteria:

- Did not work for pay or profit in the reference week of the survey.
- Actively looked for work in the previous four weeks.[36] Passive job search activities, such as reading newspaper want ads or surfing Internet job sites, do not count.
- Were available to take a job in the reference week. Persons who could not have accepted a job in that week would be categorized as *not in the labor force*.

The definitions of unemployment in the 2000 decennial Census and the 2003 and 2004 ACS surveys are quite similar to those of the monthly CPS survey except that they do not distinguish active from passive job search. This more liberal definition of unemployment in the decennial Census and the ACS surveys yields higher levels and rates of unemployment than the CPS survey. For example, according to the findings of the 2004 ACS surveys, the unemployment rate of the state was 6% versus an unemployment rate of only 4.9% from the CPS surveys.

The data on the civilian labor force of the state can be combined with estimates of the civilian, non-institutional working-age population to derive estimates of *civilian labor force participation rates*. The civilian labor force participation rate for any demographic/socioeconomic subgroup simply represents the ratio of the civilian labor force to the number of persons in the civilian, non-institutional population in that same subgroup. Changes in the labor force participation rates of Massachusetts' residents, including both men and women, over time are important determinants of changes in the size of the state's resident labor force.

Endnotes

1. For a review of the alternative uses of labor force data in analyzing a wide variety of labor market, output, income and earnings variables, *See*: Andrew Sum, Neal Fogg, and Neeta Fogg with Sheila Palma, *Analyzing the Labor Force: The Use of Labor Force Concepts, Measures, Data Sources, and Applied Research Techniques*, Report Prepared by the Center for Labor Market Studies for the National Labor Market Information Training Institute, July 1995.

2. *See*: Andrew Sum, Paul Harrington and Lorraine Amico, *Cracking the Labor Market for Human Resource Planning*, National Governors Association, Center for Economic Analysis, Washington, D.C., 1982.

3. For a review of the supply GDP model and the role of labor force participation, labor force utilization, and the mean amount of annual hours of labor supply in determining the GDP of nations and the GSP of state economies, *See*: (i) Andrew Sum, Donna Desrochers, W. Neal Fogg, *An Aggregate Production Function Approach to Analyzing Gross State Product Performance*, Paper Prepared for the Eastern Economic Association Meetings, Boston, 1998; (ii) Ishwar Khatiwada and Andrew Sum, with Sheila Palma, *The Real Output Performance of the New England Economy, 1989-2000: Implications for Future Regional Workforce Development Policies*, Reported Prepared for the U.S.

Department of Labor, New England Regional Office of the Employment and Training Administration, Boston, August 2002; (iii) Ishwar Khatiwada, Andrew Sum, and Mykhaylo Trubs'kyy, *The Real Output Performance of the Massachusetts Economy, 1989-2000: Trends in the Industrial Composition of Real Output and Their Implications for Future State Economic Development Policies*, Center for Labor Market Studies, Northeastern University, Boston, October 2002.

4. *See*: Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, Henry Regency Company, Chicago, 1996.

5. For a review of the role of human resources and human capital investments in influencing the economic development and growth of nations, *See*: (i) Frederick Harbison, *Human Resources as the Wealth of Nations*, Oxford University Press, New York, 1978; (ii) Gary Becker, "The Age of Human Capital", in *Education in the Twenty-First Century*, (Editor: Edward P. Lazear), Hoover Institution Press, Stanford, 2002, pp. 3-8; (iii) Eric A. Hanushek, "The Importance of School Quality", in *Our Schools and Our Future*, (Editor: Paul E. Peterson), Hoover Institution Press, Stanford University, Stanford, 2003, pp. 141-196; (iv) George Coulombe and Jean-Francois Tremblay, *Literacy Scores, Human Capital, and Growth Across Fourteen OECD Countries*, Department of Economics, University of Ottawa, Ottawa, 2003.

6. For a more detailed review of labor force, employment, and unemployment developments in Massachusetts during the decade of the 1990s, *See*: Andrew Sum, Paul Harrington, et.al., *The State of the American Dream in Massachusetts: 2002*, Massachusetts Institute for A New Commonwealth and Blue Cross Blue Shield of Massachusetts, Boston, 2002.

7. While a number of 14-15 year olds do work in the U.S., the federal government does not collect data on their labor force status either through the monthly CPS surveys or the decennial censuses. The U.S. Census Bureau shifted to the 16 and older definition of the working-age population beginning with the 1970 Census. The CPS household surveys made this shift in the official labor force statistics in the late 1960s on the recommendations of a Presidential advisory committee on labor market statistics known as The Gordon Committee after its Chairman, Robert Aaron Gordon. *See*: The National Commission on Employment and Unemployment Statistics, *Counting the Labor Force*, U.S. Government Printing Office, Washington, D.C., 1979.

8. *See*: Andrew Sum, Anwiti Bahuguna, Neeta Fogg, et.al., *The Road Ahead: Emerging Threats to Workers, Families, and the Massachusetts Economy*, Teresa and H. John Heinz III Foundation and the Massachusetts Institute for a New Commonwealth, Boston, 1998.

9. *See*: Stuart A. Gabriel, Janice Shack-Marquez, and William Wascher, *Regional Labor Markets, Cost of Living Differentials, and Migration*, Federal Reserve Board of Governors, Washington, D.C., 1988.

10. *See*: Andrew Sum, Paul E. Harrington, Neeta Fogg, et.al., *The State of the American Dream in Massachusetts 2002*, Blue Cross Blue Shield of Massachusetts, Massachusetts Institute for A New Commonwealth, Boston, 2002.

11. Robert Nakosteen, Michael Goodman, Dana Ansel, et.al., *Mass Migration*, Mass Housing, MassINC, and the University of Massachusetts Donahue Institute, Boston, 2003.

12. *See*: Andrew Sum, Johan Uvin, Dana Ansel, et.al., *The Changing Face of Massachusetts*, Massachusetts Institute for A New Commonwealth, Boston, 2005.

13. For other national evidence on the influence of schooling and literacy /numeracy proficiencies on the employment, earnings, and incomes of immigrants, *See*: Andrew Sum, Irwin Kirsch, and Kentaro Yamomoto, *A Human Capital Concern: The Literacy Proficiency of US Immigrants*, Center on Global Assessment, Educational Testing Service, Princeton, 2003.

14. *See*: Princeton Survey Research Associates, *The Pursuit of Happiness: A Survey of the Quality of Life in Massachusetts*, Massachusetts Institute for A New Commonwealth, Boston, May 2003.

15. Scott Helman, "Census Estimate A Concern for State," *Boston Globe*, December 23, 2005, pp.A-1.

16. Michael Levenson, "Most Who Left State Don't Plan to Return," *Boston Sunday Globe*, May 14, 2006, pp. A-1, A-18-19.

17. Kimberly Blanton, "Home Costs Are Called a Drag on State Growth," *Boston Globe*, May 22, 2006, pp. A-1, A-4.

18. The American Community Survey is a large-scale household survey conducted annually by the U.S. Census Bureau since 2000. The survey uses a version of the long-form questionnaire form the 2000 Census. The survey collects data on the geographic mobility of respondents, the states from which they moved, their nativity status, and the timing of their arrival in the U.S. Nearly 13,000 households were interviewed in Massachusetts in 2003 and 2004.

19. For example, the sharp rise in the civilian labor force participation rate of women in the U.S. during the 1960s and 1970s was driven by both an increase in the incidence of participation and higher labor force intensity, *See*: Andrew M. Sum, "Women in the Labor Force: Why Projections Have Been Too Low", *Monthly Labor Review*, July 1977, pp. 18-24.

20. For a review of male labor force behavior in Massachusetts and New England during the 1990s, *See*: Andrew Sum, Ishwar Khatiwada, Jacqui Motroni, and Sheila Palma, *The Absent Male Worker and the Limited Growth in New England's Labor Male Worker and the Limited Growth in New England's Labor Force in the 1990s: Implications for Future Workforce Development Policy*, Report Prepared for the U.S. Department of Labor, Employment and Training Administration, New England Regional Office, Boston, 2002.

21. For a more detailed analysis of labor force and employment developments for teens and young adults across the nation and in Massachusetts since 2000, *See*: Joseph McLaughlin, Andrew Sum, and Ishwar Khatiwada, *Still Young, Idle and Jobless: The Continued Failure of the Nation's Teens to Benefit From Renewed Job Growth*, Center for Labor Market Studies, Northeastern University, Report Prepared for Jobs for America's Graduates, January 2006.

22. *See*: Andrew Sum, Kamen Madjarov, Joseph McLaughlin, *The Deterioration in the Labor Market Fortunes of Massachusetts High School Students and Young Dropouts, 2000-2004: Implications for the Connecting Activities and Other Workforce Development Programs to Boost Teen Employment Prospects*, Center for Labor Market Studies, Northeastern University, Prepared for the Boston Workforce Solutions Group and the Commonwealth Corporation, April 2006.

23. For a review of the labor force behavior of the poor and near poor population in New England and Massachusetts, *See*: (i) Neeta Fogg and Andrew Sum, et. al., *Recent Trends in Poverty and Other Income Inadequacy Problems in New England: Implications for Future Anti-Poverty and Workforce Development Policies*, Center for Labor Market Studies, Northeastern University, Prepared for the U.S. Department of Labor's Employment and Training Administration, New England Regional Office, November 2002; (ii) Ishwar Khatiwada, Andrew Sum, et. al., *Poverty, Near Poverty and Other Low Income Problems Among Massachusetts Families in 2003-2004: Implications for State Workforce Development Policy*, Center for Labor Market Studies, Northeastern University, Prepared for The Commonwealth Corporation, June 2006.

24. The estimates of the number of non-workers citing health or disability reasons for not seeking work are based on the findings of the March CPS work experience supplements for 2000, 2004, and 2005.

25. For a recent comprehensive review of the labor force behavior, labor market problems, and income inadequacy problems of the disabled population, *See*: (i) Ishwar Khatiwada, Andrew Sum, et. al., *The Labor Force Behaviors, Employment and Earnings Experiences, and Labor Market Problems of the Disabled Working-Age Population in Massachusetts, New England, and the U.S. in 2003 and 2004*, Center for Labor Market Studies, Northeastern University, Prepared for the Commonwealth Corporation and Massachusetts Rehabilitation Commission, Boston, June 2006; (ii) Ishwar Khatiwada, Andrew Sum, et. al., *Income Inadequacy Problems Among the Disabled Adult Population in Massachusetts, 2003-2004: Implications for Future State Antipoverty and Workforce Development Policy*, Center for Labor Market Studies, Northeastern University, Prepared for the Commonwealth Corporation and Massachusetts Rehabilitation Commission, June 2006.

26. For a review of the labor force participation behaviors and labor market experiences of older workers and the well-being of future retirees in Massachusetts, *See*: (i) Peter Doeringer, Andrew Sum, and David Terkla, *Older Workers: An Essential Resource for Massachusetts, The Commonwealth of Massachusetts Blue Ribbon Commission on Older Workers*, Boston, April 2000; (ii) Alicia H. Munnell, Kevin E. Cahill, et.al., *The Graying of Massachusetts: Aging, The New Rules of Retirement, and the Changing Workforce*, The Massachusetts Institute for A New Commonwealth, Boston, 2005.

27. For example, the decennial censuses collect data on the entire resident population of the state including residents of group quarters (college dormitories, boarding schools) and inmates of institutions (jails, prisons, nursing homes). The monthly CPS surveys do not survey institutions and do not include most college students from other states attending college in Massachusetts. The American Community Surveys only survey individuals living in private households. They do not interview residents of group quarters or inmates of institutions, such as jails or nursing homes.

28. The long form questionnaires administered to a large representative set of households in each state (approximately 1 of every 6 households) are the source of the labor force data from the decennial Censuses. Since 1970, labor force data have been collected from all household members 16 and older.

29. For examples of the published data from the CPS surveys, *See*: U.S. Bureau of Labor Statistics, *Geographic Profile of Employment and Unemployment, 1976*, BLS Bulletin, U.S. Government Printing Office, Washington, D.C., 1977. The most recently-released annual CPS labor force data for states and metropolitan areas are for 2004.

30. The ACS survey only collects data from households. It does not collect data from individuals living in group quarters (dormitories, boarding schools, fraternities) or in institutions (jails, prisons, nursing homes).

31. Unfortunately, the ACS public use files do not contain substate geographic identifiers. We cannot identify the metropolitan area, county, or city in which the responding household resided. The U.S. Census Bureau does, however, publish selected labor force data from the ACS surveys for 8 counties and two cities (Boston and Springfield).

32. The annual average CPS and LAUS labor force estimates for the state do not always exactly agree. For example, the revised CPS 2000 and 2005 labor force estimates for Massachusetts show moderate growth in the labor force over this five year period while the annual average LAUS estimates show no growth at all over the same five year period.

33. The decennial Censuses also provide estimates of the *resident labor force* including members of the armed forces stationed in the state. The civilian labor force estimates of the Census exclude members of the armed services.

34. The CPS survey does theoretically interview residents of group quarters, such as rooming houses, boarding schools, and college dormitories, but we find few interviews with residents of groups quarters in recent years in our state.

35. Those who perform volunteer work for a non-profit organization or a government agency are not considered to be employed. The American Time Use Survey collects information on volunteering activities of the working-age population, including the employed and non-employed.

36. Jobless persons on temporary layoff from their jobs who expect to be recalled by their employer in the next six months, do not have to meet the active job search test, but must be available for employment.

II. THE MASSACHUSETTS LABOR FORCE

Historical Trends in the Size of the Massachusetts Civilian Labor Force, 1970-2000

The absence of any growth in the Massachusetts labor force over the past five years (2000-2005) needs to be placed in historical perspective. How unique is such an absence of labor force growth and how well had Massachusetts performed relative to the nation and other states in prior decades? To identify historical trends in the size of the state's resident labor force, we analyzed data from the decennial censuses for the years 1970 to 2000. The absolute and relative size of the increases in the state's resident civilian labor force over these three decades are displayed in Table 1 together with comparable data for the nation.

During the decade of the 1970s, the Massachusetts civilian labor force increased very substantially, rising by nearly 427,000 or 18% (Table 1). The high rate of labor force growth in the 1970s was generated by a combination of relatively high growth in the state's working-age population (+11%) and an increase in the state's labor force participation rate from 59.6% to 63.5%. The movement of the baby boomers into their 20s and early 30s during the decade of the 1970s was a key factor underlying the growth of the working-age population.[1] All of the increase in the state's labor force participation rate was attributable to the behavior of women. Over the decade, the participation rate of the state's women rose by nearly eight percentage points while that of men fell by nearly two full percentage points.

During the decade of the 1980s, the state's resident civilian labor force again rose strongly from 2.816 million to just under 3.246 million, representing a gain of 430,000 or 15% (Table 1). The strong rise in the number of labor force participants was fueled about evenly by a rise in the working-age population and by further strong increases in the rate of labor force attachment among women. By 1990, slightly over 6 of every 10 women in the state's working-age population were actively participating in the labor force. New higher levels of foreign immigration also were playing a key role in producing labor force growth during the 1980s. Approximately 35% of the state's labor force growth between 1980 and 1990 was attributable to new foreign immigrants who arrived in the U.S. sometime between 1980 and the 1990 Census.[2] The 1980s decade, however, would mark the end of the high labor force growth era in the state. The severe state and regional recession of 1989-91 would severely reduce employment in the state, encourage high levels of domestic out-migration, and depress the labor force attachment of those remaining in the state and region.[3]

Between 1990 and 2000, the resident civilian labor force of the state increased by only 66,000 or 2%, a rate of growth only one-eighth to one-ninth as high as that of the preceding two

Table 1:

Growth in the Massachusetts and U.S. Civilian Labor Force from 1970 to 2000 by Decade

AREA/TIME PERIOD	BEGINNING YEAR	ENDING YEAR	ABSOLUTE CHANGE	PERCENT CHANGE
Massachusetts				
1970-1980	2,389,419	2,816,374	426,955	17.9%
1980-1990	2,816,374	3,245,950	429,576	15.2%
1990-2000	3,245,950	3,312,000	66,050	2.0%
U.S.				
1970-1980	80,051,046	104,449,817	24,398,771	30.5%
1980-1990	104,449,817	123,473,450	19,023,633	18.2%
1990-2000	123,473,450	137,668,000	14,194,550	11.5%

Source: U.S. Census Bureau, 1970, 1980, 1990, and 2000 Censuses of Population and Housing, tabulations by authors.

decades and only one-sixth as high as that of the nation over the same ten year period. The very limited growth of the Massachusetts labor force between 1990 and 2000 was attributable to a combination of slow growth in the size of the state's working-age population and to a decline in the state's labor force participation rate, primarily among men.[4] The working-age population of the state grew by only 4.2% over the decade despite a substantial influx of new foreign immigrants into the state. High levels of domestic outmigration held down the growth of the state's population. The state's working-age population growth rate for the decade was less than one-third of the national growth rate, and Massachusetts ranked 5th lowest among the 50 states on this demographic measure. Our two southern New England neighbors (Rhode Island and Connecticut) fared even worse, ranking 48th and 50th among the states. The state's labor force growth did not keep pace with its population growth due to a declining labor force participation rate. Between 1990 and 2000, the state's labor force participation rate is estimated to have declined from 67.5% to 66.1%.[5] The drop in the overall participation rate of the state was primarily due to the drop in the rates of participation among men in nearly all age groups, while the rate of women was unchanged (Chart 1). After steadily increasing from 1960 through 1990 as a consequence of the rising labor force attachment of women, the overall labor force participation rate of Massachusetts declined from 67.5% in 1990 to 66.1% in 2000. The state's ranking on this measure among the 50 states fell from 9th highest in 1990 to only 16th highest in 2000. The participation rate of the state in 2000 was four to five percentage points below those of the nation's leaders, which included New Hampshire and Vermont among the top five.

Chart 1:

Trends in the Labor Force Participation Rates of Working-Age Men and Women in Massachusetts, 1970 to 2000

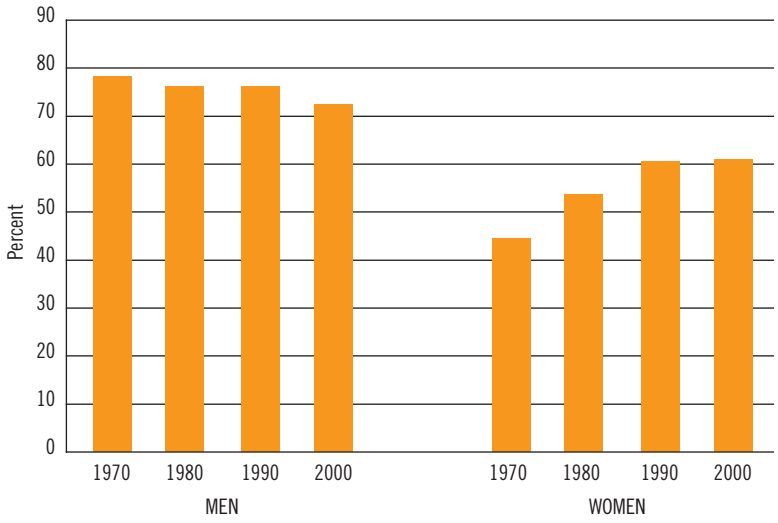


Table 2:

Growth Rates of the Civilian Labor Force (16+) in the U.S., New England, and Massachusetts: 1970-80, 1980-90, and 1990-2000 (in percent)

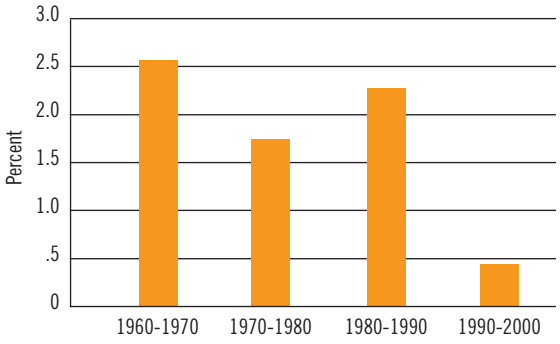
GEOGRAPHIC AREA	1970-1980	1980-1990	1990-2000
U.S.	30.5	18.2	11.5
New England	22.0	17.6	2.5
Massachusetts	17.9	15.3	2.0

Sources: 1970, 1980, 1990, and 2000 Censuses of Population and Housing, tabulations by authors.

Over the past three decades, the civilian labor force of the nation grew more rapidly than that of the state, but the size of the growth rate gaps varied widely across these three decades (Tables 1 and 2). During the 1970s, the nation experienced explosive labor force growth, with the overall number of labor force participants rising by 30%, more than 12 percentage points higher than the state's growth rate (Table 2). Both the nation and state experienced lower labor force growth during the 1980s, but the gap between the national and state labor force growth rate narrowed to three percentage points, and Massachusetts' labor

Chart 2:

Massachusetts Share of National Civilian Labor Force Growth by Decade, 1960 to 2000



force growth rate ranked 24th highest, a major improvement from its relative performance in the 1970s when the state ranked 47th.

During the decade of the 1990s, the steep decline in the rate of labor force growth in the state far exceeded that of the nation. The gap widened to 9.5 percentage points, and the state captured less than one-half of one percent of all national labor force growth during the 1990s decade (Chart 2). The state's share of labor force growth in the 1990s was only one-fifth as high as that of the 1980s and one-fourth as high as that of the 1970s. In the 1960s, the state had captured more than 2.5% of national labor force growth (Chart 2).

Massachusetts' comparative labor force growth rate in the 1990s was quite weak. The state ranked 47th lowest among the 50 states (Table 3). Three of the four slowest growing states were in New England (Connecticut, Massachusetts, and Rhode Island), and the fourth was our western neighbor, New York.[6] (Charts 3 and 4). All six of the bottom ranked states were either in the Mid-Atlantic region or in New England. This finding is an important one since it implies that Massachusetts cannot expect to grow its labor force in the future by attracting workers from many of its neighboring states. Only the two northern New England states of New Hampshire and Vermont came close to matching the U.S. growth rate, and New Hampshire accompanied today by Rhode Island has continued to attract residents from Massachusetts to relocate to their states.

The weak labor force growth of the 1990s in Massachusetts combined with strong job growth from 1993 through 2000 helped lower the unemployment rate of the state to 2.6% in 2000, the lowest unemployment rate in the state since the end of World War II.[7] By the end of the labor market boom in 2000, there was rising evidence of labor shortages in many industries and occupations, and real wages were being bid up, especially by the hiring boom in many of the infor-

Table 3:

Massachusetts' Civilian Labor Force Growth Rates Versus the U.S. and Its Rankings Among the 50 States, 1970-80 through 2000-2005 (in percent)

TIME PERIOD	MASSACHUSETTS	U.S.	MASSACHUSETTS – U.S.	RANKING AMONG 50 STATES
1970-1980	17.9	30.5	-12.6	47th
1980-1990	15.2	18.2	-3.0	24th
1990-2000	2.0	11.5	-9.5	47th
2000-2005(1)	.0	4.7	-4.7	48th
2002-2005(1)	-1.7	2.9	-4.6	50th

Note: (1) Findings on labor force growth for Massachusetts and the other 49 state for the 2000-2005 and 2002-2005 periods are based on the LAUS estimates for these years. The national labor force estimates are based on the CPS survey results.

mation industries. Some economic analysts have argued that these rising relative wages in the state were reducing our economic competitiveness and would handicap the state in its ability to generate new jobs following the recovery from the 2001 national recession and the jobless recovery of 2002-2003.[8] Labor force growth in the state would come to a halt in 2002, and three consecutive years of decline would set in.

Labor Force Developments in Massachusetts, 2000-2005

How has the size of the Massachusetts resident labor force changed over the past five years? Trends in the size of the state's resident labor force over the 2000-2005 period are displayed in Table 4. Labor market developments deteriorated sharply after 2000. Job growth in the state as measured by the monthly payroll survey of establishments and government agencies (the CES survey) came to an abrupt end in the first quarter of 2001, and payroll employment levels began to decline sharply afterwards. According to the findings of the monthly LAUS survey, the resident labor force of the state continued to experience growth through 2002, rising by 58,000 or 1.7% over this two year period.[9] The growth rate of the Massachusetts civilian labor force between 2000-2002 slightly exceeded that of the U.S. (1.6%), and the state ranked 26th highest on this measure (Table 5). Unemployment increased substantially over this two-year period, doubling in size from 92,000 in 2000 to 181,000 in 2002. The unemployment rate rose from 2.7% to 5.3%.

Over the 2002-2005 period, however, the resident labor force of the state declined steadily each year, falling by 59,000 or 1.7% (Table 4 and 5). By 2005, the resident labor force of the state had fallen back to its 2000 level. Thus, there was no growth whatsoever in the state's resident labor force between 2000 and 2005. During the same five year period, the U.S. civilian labor force grew by nearly 5 percent, and Massachusetts ranked third lowest among the 50 states on this measure.

What is somewhat perplexing and troublesome is the persistent drop in the size of the resident labor force from 2002 through 2005 and the continuing decline during the first five months of 2006. Steep job losses over the 2001 to 2003 period and the sharp rise in unemploy-

Chart 3:

Growth Rates of the Labor Force in the Six States with the Lowest Labor Force Growth Rates 1990-2000

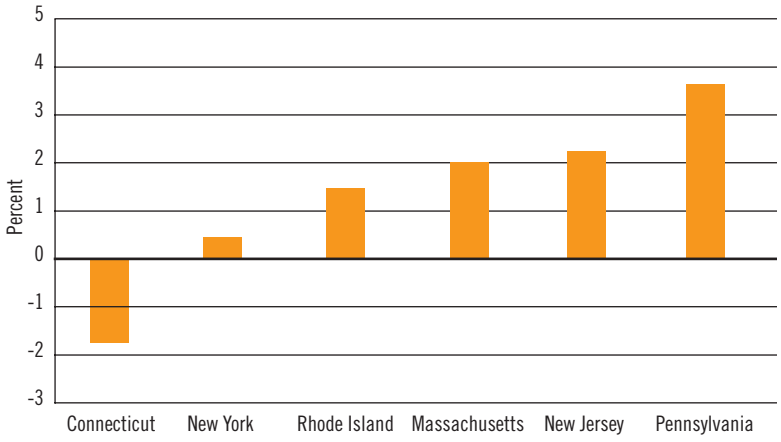


Chart 4:

Comparisons of the Growth Rates of the Civilian Labor Force in Each of the Six New England States, 1990-2000

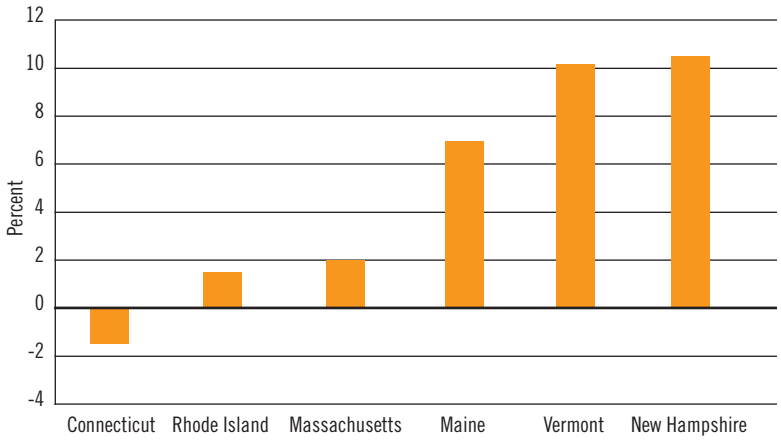


Table 4:

Trends in the Massachusetts Resident Labor Force, Total and by Labor Force Status, of Working-Age Residents, 2000-2005 (Annual Averages, in 1000s)

YEAR	RESIDENT LABOR FORCE	UNEMPLOYED	EMPLOYED
2000	3,365.6	92.3	3,273.3
2001	3,401.3	126.0	3,275.3
2002	3,423.6	181.0	3,242.6
2003	3,405.9	197.3	3,208.6
2004	3,374.9	176.0	3,198.9
2005	3,364.5	161.5	3,203.0
Change, 2000-2005	-1.1	+69.2	-70.3

Source: U.S. Bureau of Labor Statistics, LAUS program, web site.

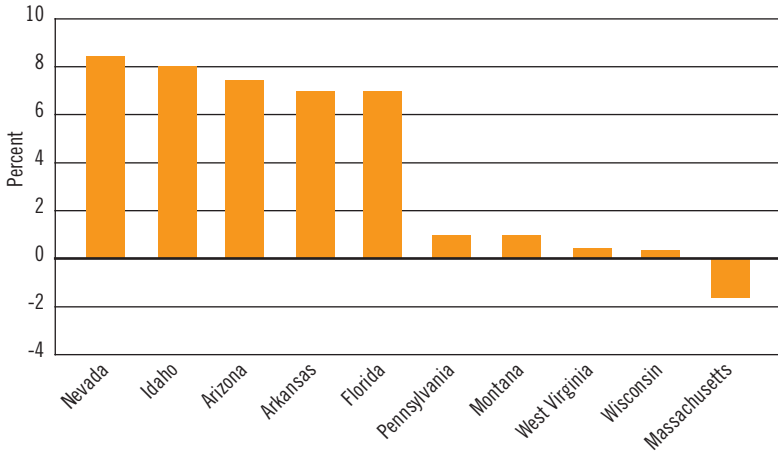
Table 5:

The Growth of the Massachusetts and U.S. Resident Labor Force Between Selected Time Periods, 2000-2005, and the State's Ranking Among the 50 States (in percent)

TIME PERIOD	MA GROWTH RATES	U.S.	MA–U.S.	MA RANK AMONG 50 STATES
2000-2005	0	4.7	-4.7	48th
2000-2002	1.7	1.6	+0.1	26th (tie)
2002-2005	-1.7	3.1	-4.8	50th

Chart 5:

Five States with the Highest and Lowest Growth Rates in Their Resident Labor Force Between 2002 and 2005



ment over this three year period may have been expected to adversely affect labor force growth through discouragement effects among potential participants and higher levels of out-migration of residents to other states. Payroll job growth in the state was renewed in early 2004, and modest job growth took place through 2005 yet the resident labor force continued to decline. The Massachusetts' labor force experience over the 2002-2005 period was unique. Our state was the only state in the nation to experience an actual decline in its labor force over this three-year period. Five high-growth states, including Arizona, Florida, and Nevada, experienced labor force growth rates in the 7 to 8 percent range during this period, and the five worst performing states achieved at least some positive labor force growth (Chart 5).

The absence of any growth in the Massachusetts labor force from 2000 to 2005 also contrasts sharply with the experiences of the other five New England states. Between 2000 and 2005, each of the other five New England states experienced labor force growth rates ranging between 4.6% (Connecticut) and 6.0% (Vermont) (Chart 6). Massachusetts was the only New England state to fail to experience any net increase in its labor force during this period. As will be revealed in following section, the absence of any labor force growth in the state appears to have been attributable to a combination of very limited growth in the size of the state's working-age population and a modest decline in the state's civilian labor force participation rate. The drop in labor force attachment of the working-age population offset the modest rise in the size of the population. Understanding the underlying demographic forces and labor force behavior changes of population subgroups in our state is critical for both economic development and workforce development policymaking and planning in the Commonwealth.

Data on labor force developments in Massachusetts during 2006 are available for the first five months, January-May. For this five month period, the average size of the state's resident labor force (seasonally adjusted) was 3.354 million, which was nearly 10,000 or 0.3% below its level during the same five month period in calendar year 2005 (Table 6). Over the same time period, the U.S. civilian labor force exhibited strong growth with the nation's labor force rising by 1.8 million or 1.3% over this twelve month period. Massachusetts was not the only state to experience a decline in its labor force between the first five months of 2006 and the same five month period in 2005. Minnesota, Nebraska, Mississippi, and Louisiana also saw their labor force drop over this time period, with the relative size of the declines being equal to approximately 2 and 10 percent, respectively in the latter two states (Chart 7). The steeper drop in the labor forces of Mississippi and Louisiana was attributable to the labor market and population displacement effects of Hurricane Katrina. In the absence of the Katrina effect, Massachusetts would have ranked last among the 50 states in its rate of labor force growth over the past year. Again, Massachusetts was the only New England state to fail to generate any labor force growth over the past year. Each of the other five New England states experienced some labor force growth over the past year, with the growth rates ranging from 0.8% in New Hampshire and Connecticut to a high of 2.0% in Vermont (Chart 8). These findings should be viewed as very troublesome by the state's economic policymakers. The state is heading for a fourth consecutive year of labor force decline, a historically unprecedented development. To obtain a better understanding of the demographic forces underlying the limited labor force growth in Massachusetts in the 1990s and the absence of any labor force growth over the past six years, we will now turn to an analysis of changes in the size and age composition of the state's working-age population and the sources of recent population change.

Chart 6:

Growth Rates of the Resident Labor Force of Each New England State Between 2000 and 2005

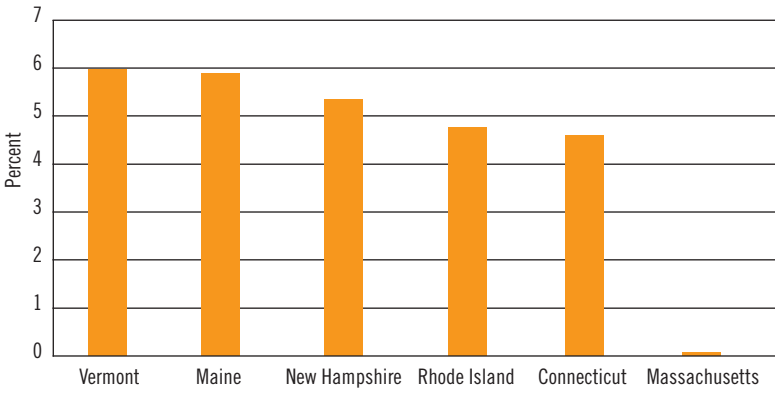


Table 6:

Labor Force Developments in Massachusetts, January-May 2005 to January-May 2006 (Seasonally Adjusted)

JANUARY-MAY 2005	JANUARY-MAY 2006	ABSOLUTE CHANGE	PERCENT CHANGE
3,363,924	3,354,020	-9,896	-0.3

Chart 7:

Percent Changes in the Resident Labor Force of the Five States Experiencing Labor Force Declines, January-May 2005 to January-May 2006

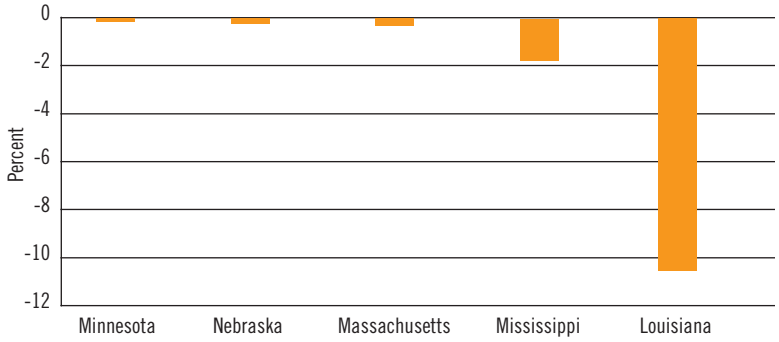
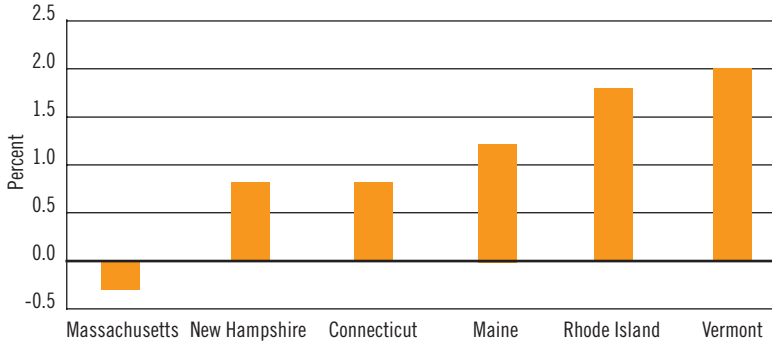


Chart 8:

Percent Change in the Labor Force of New England States, January-May Average 2005 to January-May Average 2006



Growth of the Resident Labor Force Across Counties of Massachusetts, 2000-2005

According to the findings of the LAUS program, the resident labor force of the state over the 2000-2005 period was unchanged, with growth between 2000-2002 being offset by declines over the past three years. Our previous findings on population growth rates by county over this time period revealed substantial variations across the fourteen counties of the state, generated in large part by variations in levels of domestic in and out-migration, including shifts in population from one set of counties to another within the state. Job growth and decline also varied considerably across counties of the state over the past four years with substantial job losses in Suffolk County and large segments of Middlesex County. Job losses can discourage some individuals from actively seeking work, thereby reducing the size of the local labor force. Teens, minority workers, less educated workers, and married women's participation decisions are particularly sensitive to changes in labor market conditions.

JOB GROWTH VARIED CONSIDERABLY ACROSS COUNTIES OF THE STATE

Estimates of the annual average size of the resident labor force in each county of the state, in 2000 and 2005 are displayed in Table 7.[10] Between 2000 and 2005, the local labor force increased in nine counties, was unchanged in Essex County, and declined in Norfolk, Middlesex, and Suffolk counties. The rates of changes in the resident labor force of these counties ranged from lows of nearly -5 percent in Suffolk County and -2 percent in Middlesex County to highs of +7 percent in Barnstable County and over +8 percent in Dukes County. The patterns of labor force change closely followed those of changes in the resident populations of these 13 counties over the past five years. The 38,600 decline in the combined labor forces of Norfolk, Middlesex, and Suffolk Counties was sufficiently large to offset the growth in the resident labor force of the other 10 counties of the state. In addition to the cyclical effects on labor force growth, there appear to be structural forces at work in reducing the labor force of Suffolk and Middlesex Counties. Even during the 1990s, when state labor markets, especially the Boston metropolitan area, added a considerable number of payroll jobs from 1992-2000, the labor force of Suffolk County was estimated to have declined by two percent while that of Middlesex and Norfolk Counties was basically unchanged.[11]

The decline in the labor force of Middlesex, Norfolk, and Suffolk Counties was accompanied by an even greater decline in their employed population due to the rise in unemployment between 2001 and 2005. Over this four year period, the number of employed residents in these three counties fell by more than 64,000, a decline of nearly 4.5 percent. The weakness of the economies in these three counties was pushing up unemploy-

ment, encouraging out-migration of residents, and reducing the size of the resident labor force. Since most out-migrants will not return to Massachusetts, their loss will hamper the ability of the state's labor force to grow in the future. A smaller and less well-educated labor force may also adversely affect the economic competitiveness of the Boston metropolitan economy. The educational attainment and literacy/numeracy proficiencies of adults have strong independent impacts on their labor force participation behavior, their ability to obtain paid employment when they do seek work, their access to more highly skilled occupations, and their weekly and annual earnings.[12] The educational attainment and occupational skills of workers in state and local economies also have been found to influence their level of aggregate real output (Gross State Product), labor productivity, and the growth rates of output, real income per capita, and real earnings.[13] The literacy, math, and science proficiencies of a country's population, including the proficiency scores of the average adult, have been found to significantly influence the growth rates of their countries' real output levels.[14]

The Impact of In- and Out-Commuting in Massachusetts on the Pool of Employed Workers in the State

We analyzed the findings of the 2003 and 2004 ACS surveys to identify both the number of workers commuting into Massachusetts from each of the other five New England states and New York and the number of Massachusetts residents who commuted out of the state for employment in one of these other six states. Findings from the 2004 ACS surveys are displayed in Table 8.

During 2004, more than 163,000 workers commuted into Massachusetts from one of these six states while 103,000 Massachusetts residents commuted out of the state into one of these six states, yielding a new inflow of commuters of 60,154 during calendar year 2004. The two states accounting for the largest numbers of in-commuters were Rhode Island (58,557) and New

Table 7:

Trends in the Size of the Resident Labor Force by County in Massachusetts, 2000-2005

COUNTY	2000	2005	ABSOLUTE CHANGE	PERCENT CHANGE
Nantucket	7,285	8,015	730	10.0
Dukes	10,068	10,907	839	8.3
Barnstable	113,365	121,242	7,877	6.9
Hampshire	86,556	89,152	2,596	3.0
Bristol	278,203	286,165	7,962	2.9
Berkshire	70,051	71,902	1,851	2.6
Worcester	387,841	395,133	7,292	1.9
Hampden	219,254	222,884	3,630	1.7
Franklin	39,202	39,827	625	1.6
Plymouth	251,284	255,217	3,933	1.6
Essex	372,511	372,724	213	0.1
Norfolk	357,112	351,852	-5,260	-1.5
Middlesex	821,779	805,209	-16,570	-2.0
Suffolk	351,064	334,270	-16,794	-4.8

Source: Massachusetts Division of Unemployment Assistance, "Local Area Labor Force, Unemployment and Employment Statistics", web site.

Chart 9:

Estimated Declines in Resident Employment in Selected Counties of Massachusetts, 2001-2005 (Annual Averages)

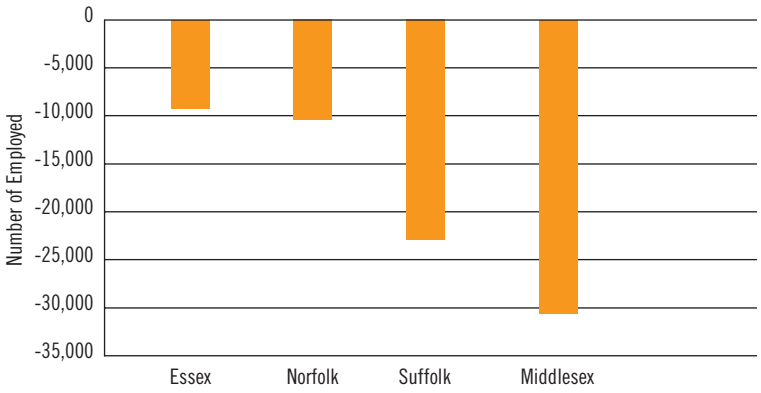


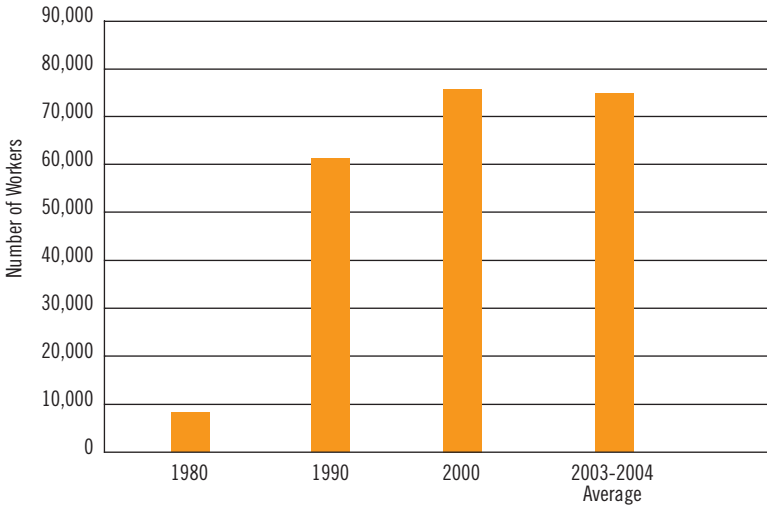
Table 8:

Working Commuters Into and Out of Massachusetts from Other New England States and New York, 2004

STATE	COMMUTERS INTO MASSACHUSETTS	COMMUTERS OUT OF MASSACHUSETTS	NET COMMUTERS
Connecticut	16,296	31,110	-14,814
Maine	3,815	1,140	2,675
New Hampshire	77,451	33,848	43,603
New York	4,610	3,550	1,060
Rhode Island	58,557	30,481	28,076
Vermont	2,517	2,957	-440
Total, Above 6 States	163,240	103,086	60,154

Chart 10:

Net In-Commuting of Workers into Massachusetts from Connecticut, Maine, New Hampshire, New York, Rhode Island, and Vermont, 1980, 1990, 2000, 2003/2004



Hampshire (77,451). The flows of in- and out-commuters between Massachusetts and both New York and Vermont were approximately in balance, and Connecticut received more in-commuters from Massachusetts than it sent to our state (-14,800).

Knowledge of time trends in net commuter inflows into Massachusetts in recent decades and especially since 2000 would be helpful in interpreting the labor force data for Massachusetts. If net in-commuting into our state has risen sharply since 2000, it could help account for the absence of labor force growth. These in-commuters may work in Massachusetts, but they are not counted in our resident labor force statistics. To identify time trends in net commuting inflows of workers into Massachusetts, we analyzed the findings of the 1980, 1990, and 2000 Censuses and the American Community Surveys for 2003 and 2004. Between 1980 and 1990, there was a major increase in net in-commuting into Massachusetts, with a rise from 8,720 to 61,050. Payroll employment in the state rose more rapidly than the household survey's count of employed residents over this decade. Between 1990 and 2000, the number of net in-commuters rose again from 61,000 to more than 76,000, a gain of slightly more than 15,000 (Chart 10).

Since 2000, however, net in-commuting by workers seems to have been quite stable. The average number of net in-commuters into Massachusetts based on the findings of the 2003-2004 ACS surveys was 75,632, which was approximately 500 less than the estimated number in 2000 at the time of the Census.[15] Given the sharp drop in state payroll employment over this time period, one might have expected an even larger drop in the number of in-commuters into the state. However, continued out-migration of Massachusetts residents to surrounding New England states since 2000 apparently was large enough to offset the decline in in-commuters due to payroll job losses between 2001 and 2004. The findings in Chart 10 clearly indicate that the absence of resident labor force growth in our state since 2000 cannot be attributed to any substantive increase in net in-commuting of workers into Massachusetts from other New England states or from New York.

Endnotes

1. The post-World War II baby boom generation is typically defined as those persons born between 1946 and 1964. The last members of the baby boom generation became working-age in 1980. *See*: Landon Y. Jones, *Great Expectations: America and the Baby Boom Generation*, Coward, McCann and Geoghegan, New York, 1980.

2. For further details on immigrant contributions to labor force growth in the state and the nation during the 1980s, *See*: Andrew M. Sum, W. Neal Fogg, et al., *Immigrants and the New Workforce in Massachusetts*, Massachusetts Institute for A New Commonwealth, Boston, 1999.

3. *See*: Andrew M. Sum, Paul E. Harrington, et al, *The New England Economy in Recession: An Assessment of Its Economic and Social Consequences*, Center on Education and the Economy, Northeastern University, Boston, 1992.

4. The New England region as a whole experienced very limited labor force growth over the decade, with the resident labor force increasing by only 2.5%. This rate of growth was only 20% as high as that of the nation, and the region ranked second lowest among the nine geographic regions, only the Mid-Atlantic region fare worse. *See*: Andrew Sum, Ishwar Khatiwada, Nathan Pond with Jacqui Motroni and Sheila Palma, *Labor Force Growth in New England: Past, Current, and Future Trends and Their Implications for Workforce Development Policy*, Report Prepared for the U.S. Department of Labor, Employment and Training Administration, New England Regional Office, Boston, June 2002.

5. The labor force participation rates from the decennial Censuses differ slightly from those of the monthly Current Population Surveys (CPS). The decennial Census measures include the military in the numerator and inmates of institutions are included in the denominator. The CPS measures of civilian labor force participation, exclude the military and are confined to the civilian non-institutional population.

6. For a more detailed review of regional labor force developments in the 1990s, *See*: Andrew Sum, Ishwar Khatiwada, Jacqui Motroni, et al, *New England Labor Force Developments and Their Workforce Development Implications*, Report Prepared for the U.S. Department of Labor, Employment and Training Administration, New England Regional Office, Boston, November 2003.

7. For an analysis of state unemployment developments in the 1990s, *See*: Andrew Sum, Paul Harrington, Dana Ansel, et al, *The State of the American Dream in Massachusetts, 2002*, Massachusetts Institute for A New Commonwealth, Boston, 2002.

8. *See*: Ross Gittell and Jeffrey Sohl, "Technology Centers During the Economic Downturn: What Have we Learned?" *Entrepreneurship and Regional Development*, July 2005, pp. 293-312.

9. The LAUS survey is an anonym for the Local Area Unemployment Statistics program, a cooperative statistical program between states and the U.S. Bureau of Labor Statistics that provides monthly and annual estimates of the labor force, employed, and unemployed residents of states and substate areas.

10. The LAUS labor force estimates for substate areas are not based directly on household surveys, such as the CPS, but instead rely on a variety of administrative data sources including counts of payroll jobs, unemployment insurance claims, and estimates of the working-age population. For further details on the LAUS labor force and employment estimating methodologies, *See*: U.S. Bureau of Labor Statistics, web site, www.bls.gov.

11. The estimates of labor force change by county of the state between 1990 and 2000 are based on the findings of the 1990 and 2000 decennial censuses. There are very large sample sizes underlying these estimates of the local labor force.

12. *See*: (i) Richard J. Murnane and Frank Levy, *Teaching the New Basic Skills*, The Free Press, New York, 1996; (ii) Andrew Sum, *Literacy in the Labor Force*, National Center for Education Statistics, Washington, D.C., 1999; (iii) Andrew Sum, Irwin Kirsch, and Kentaro Yamomoto, *Pathways to Labor Market Success: The Literacy Proficiency of U.S. Adults*, Policy Information Center, Educational Testing Service, Princeton, 2004.

13. For findings on the impact of the formal school and occupational skills of a state's and metropolitan area's workforce on its aggregate output level, real income per capita, and labor productivity, *See*: (i) Andrew Sum, Donna Desrochers, and Neal Fogg, *Modelling State GSP Performance: An Aggregate Production Function Approach*, Paper Presented to the Eastern Economic Association, Boston, March 1996; (ii) Randall W. Eberts, George Erickcek, and Jack Kleinheinz, "Development of a Regional Economic Dashboard," Upjohn Institute Employment Research, Kalamazoo, July 2006.

14. *See*: (i) Eric Hanushek and Dennis D. Kimko, "Schooling, Labor Force Quality and the Growth of Nation's," *American Economic Review*, 2001, pp.; (ii) Serge Coulombe, Jean-Francoic Tremblay, and Sylvie Marchand, *Literacy Scores, Human Capital, and Growth Across Fourteen OECD Countries*, Statistics Canada, June 2004.

15. The Census questionnaires were mostly completed in March and April of 2000, than, the commuting data pertain to these two months while the ACS interviews were completed throughout the year.

III. TRENDS IN THE WORKING-AGE POPULATION AND OUTMIGRATION

Trends in the Working-Age Population of Massachusetts, 1960-2000 and 2000-2005

Demographic forces can play a powerful role in determining both the size and the demographic/human capital characteristics of a state's resident labor force. Changes in the overall size of the state's working-age population (16 and older) and its age/gender/educational composition will have important independent influences on the size of its resident labor force.[1] Data depicting trends in the growth of the state's working-age population by decade between 1960 and 2000 are displayed in Table 9 together with estimates of the growth in the U.S. working-age population over the same 40 year period.

During both the 1960s and the 1970s, the working-age population of Massachusetts increased by slightly more than 11%, helping boost the growth rates of the resident labor force. During the 1980s, the working-age population grew more slowly, rising by slightly under 8% as the members of the baby bust generation entered the ranks of the working-age population. During the 1990s, the working- age population of the state grew even more slowly, increasing by only 4.2% despite a substantial influx of new working-age immigrants into the state. High levels of domestic out-migration during the first half of the 1990s reduced the growth of the working-age population. From 1990 to 1997, net domestic migration in Massachusetts was estimated to be -221,000.[2]

The working-age population of Massachusetts grew more slowly than that of the nation over each decade between 1960 and 2000; however, the relative size of these differences in growth rates widened over this period. For example, in the 1960s, the growth of the state's working-age population was two-thirds as high as that of the nation (11.6% vs. 16.9%). During the 1970s, the state's working-age population grew at only half of the national average. By the 1990s, the state's population growth rate had declined to only one-third of that of the nation (4.2% vs. 12.3%), with high levels of domestic out-migration playing a key role in holding down the growth of the state's population over the past decade.

How has the resident population and the working-age population of the state changed since 2000? Estimates of the total resident population

Table 9:

Trends in the Growth of the Working-Age Population (16+) of Massachusetts, 1960-2000 (Numbers in 1000s)

TIME PERIOD	BASE YEAR POPULATION	ENDING YEAR POPULATION	CHANGE IN POPULATION OVER DECADE	PERCENT CHANGE IN POPULATION OVER DECADE	PERCENT CHANGE IN U.S. POPULATION
1960-1970	3,592	4,009	417	11.6%	16.9%
1970-1980	4,009	4,460	451	11.2%	22.3%
1980-1990	4,460	4,810	350	7.8%	12.8%
1990-2000	4,810	5,012	202	4.2%	12.3%

Sources: (i) U.S. Census Bureau, Censuses of Population and Housing, 1960 to 2000; selected publications; (ii) 1960 Census of Population and Housing, PUMS files, tabulations by authors.

of Massachusetts for each year from 2000 through 2005 are displayed in Table 10.[3] From 2000 through 2003, the resident population of the state is estimated by the U.S. Census Bureau to have increased but at a diminishing rate. Over this three year period, the state's population grew by 55,000 or slightly under 1 percent. Over the next two years, however, the state's population is estimated to have declined, falling by nearly 19,000. Massachusetts was the only state in the nation to have experienced a population decline for these two consecutive years. For the 2000-2005 period as a whole, the resident population rose by only 36,611 or 0.6% (Table 9). In comparison, the population of the nation is estimated to have increased by nearly 15 million or 5.3%. Massachusetts' population growth rate ranked 48th among the 50 states over this five year period. Only West Virginia (+0.5%) and North Dakota (-0.9%) grew more slowly than Massachusetts over this five year period. The state captured only one-fourth of one percent of the growth in the nation's population between 2000 and 2005.

Why did Massachusetts' population grow so slowly over the past five years? To answer this question, we tracked the individual components of population change each year between July 2000 and July 2005. These components of population change are the following:

- **Natural increase** which is measured by the difference between the annual number of births and the number of deaths. If births exceed deaths, this will add to the population of the state.
- **Net domestic migration** which is measured by the difference between the number of persons who move to Massachusetts from other states and DC and the number of Massachusetts residents who move to other states. This number can be positive or negative.

Table 10:

Trends in the Resident Population of Massachusetts, All Ages, July 1, 2000 to July 1, 2005

YEAR	POPULATION
2000	6,362,132
2001	6,394,750
2002	6,411,568
2003	6,417,565
2004	6,407,382
2005	6,398,743
Change, 2000-2005	
Absolute	+36,611
Percent Change	0.6%
Change, 2002-2005	
Absolute	-12,825
Percent Change	-0.2%

Source: U.S. Census Bureau, state population estimates, web site.

- **Net international migration** which represents the difference between the number of foreign immigrants who move to Massachusetts and the number of state residents who move abroad during a given year, including former immigrants who return to their home country.

Findings on the contributions of each component of change of population growth or decline in the state over each of the past five years are displayed in Table 11 and in Chart 11. During each of the past five years, the number of births in the state exceeded the number of deaths by 24,000 to 25,000. The annual number of births did, however, decline modestly over this period. The natural increase in the population of the state over the past five years combined was just under 124,000 (Table 11). The resident population of

FROM 2000 TO 2005, THE STATE LOST 233,000 RESIDENTS TO OTHER STATES

the state would have increased by about two percent over the past five years in the absence of any domestic or international migration.

Over the same five year period, however, the number of persons leaving Massachusetts to move to other states substantially exceeded the number of in-migrants from other states. Net domestic migration became increasingly negative over the past five years, rising from about -23,000 in 2000-2001 to -60,000 to -62,000 over the past two years. For the five year period as a whole, net domestic migration was -233,000, more than offsetting the increase in the state's population from natural forces; i.e., births in excess of deaths. In the absence of new flows of foreign immigrants into the state, the resident population of the Commonwealth would likely have declined by more than 100,000.[4] Each year, the state was the recipient of a large number of new immigrant arrivals, with the annual number of net new immigrants ranging from 26,500 to 33,300. The total net increase in the immigrant population of the state over this five year period was just under 154,000, equal to approximately 2.5 percent of the state's resident population in 2000. A very high fraction of these new immigrant arrivals were of working-age, and among immigrant males the rate of attachment to the labor force was quite strong, even among men without a high school diploma.

The ACS surveys collected information on the states from which new domestic in-migrants arrived and the states to where Massachusetts out-migrants moved. With the 2003 and 2004 interview data, we identified the ten states accounting for the largest number of net out-migrants from Massachusetts on average for these two years (Table 12). The top five states were Florida, New Hampshire, Texas, Connecticut, and Rhode Island. A fourth New England state, Maine, also made the top ten list. Net out-migration from these ten states alone was -56,722, accounting for 84% of all net out-migration from the state.

Chart 11:

Components of Change in the Population of Massachusetts, 2000-2005

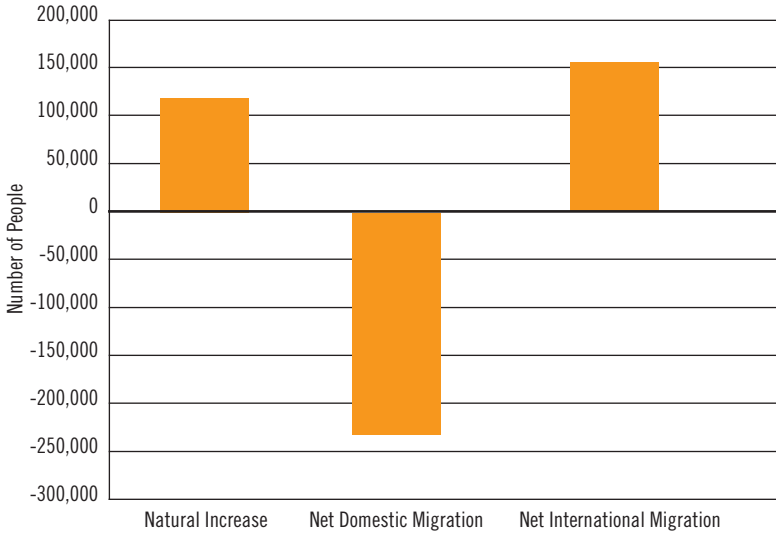


Table 11:

Sources of Population Change in Massachusetts, July 2000 to July 2005

YEAR	BIRTHS	DEATHS	BIRTHS-DEATHS	NET INTERNATIONAL MIGRATION	NET DOMESTIC MIGRATION
2000-2001	82,185	57,337	24,848	33,292	-22,892
2001-2002	81,561	56,711	24,850	33,347	-39,506
2002-2003	80,905	56,033	24,872	31,785	-48,514
2003-2004	80,557	55,668	24,889	29,041	-61,980
2004-2005	80,122	55,780	24,342	26,515	-60,053
2000-2005	+405,330	+281,529	+123,801	+153,980	-232,945

There were only two states (New York and New Jersey) from which Massachusetts attracted 2,000 more migrants than we lost to them.

The level of net domestic out-migration from Massachusetts over the past five years was quite substantial in both absolute and relative terms. In the aggregate, net internal migration between April 2000 and July 2005 was equal to -233,000. In relative terms, this level of net internal migration was equal to 3.6% of the state's resident population in 2000 (Table 13). The state's ranking on this measure was 49th among the 50 states; i.e., the second worst among the 50 states. Only New York experienced a higher relative level of net out-migration between 2000 and 2005 (Table 14). New York managed to experience some population growth over this five year period due to very high levels of foreign immigration, an increasing proportion of which was undocumented.

The impacts of these recent population changes on the labor force of the state, especially the high levels of net out-migration and incoming foreign immigration, will be dependent on the changing age composition of the state and the age/educational characteristics of domestic in and out-migrants and new foreign immigrants. Let us now turn to an examination of changes in the age structure of the state's population and the growth of the working-age population over the past five years.

Changes in the Resident Population of Massachusetts by Age Group, 2000-2005

The impact of population growth/decline on the resident labor force of the state will be dependent on the age composition of the change, especially changes in the number of persons of working-age and their age distribution given fairly large differences in labor force participation rates across

Table 12:

Ten States Accounting for the Largest Number of Net Domestic Out-Migrants from Massachusetts, 2003-2004 Averages

STATE	NET OUT-MIGRATION
Florida	12,815
New Hampshire	9,787
Texas	5,946
Connecticut	4,896
Rhode Island	4,632
North Carolina	4,470
Maine	4,385
Virginia	3,827
Illinois	3,169
Washington	2,795
Total, Above Ten States	56,722

States with 2,000 or More Net Domestic Migrants into Massachusetts

STATE	NET IN-MIGRATION
New York	4,308
New Jersey	2,114

Source: American Community Surveys, 2003 and 2004, public use files, tabulations by authors.

Table 13:

Net Internal Migration in Massachusetts, April 2000-July 2005, Total and as A Percent of Base Year Population (in 1000s)

VARIABLE	VALUE
Base Year Population, April 2000	6,349
Net Internal Migration	-233
Net Internal Migration as % of Base Year Population	-3.6%
Massachusetts Rank Among 50 States	49th

Table 14:

Five States With the Highest Relative Population Losses Due to Net Domestic Out-Migration Between 2000 and 2005

STATE	NET DOMESTIC MIGRATION AS % OF POPULATION
New York	-5.0
Massachusetts	-3.6
Illinois	-2.9
North Dakota	-2.6
New Jersey	-2.6

Table 15:

Estimates of Growth in the Resident Population of Massachusetts Between 2000-2005, All and in Selected Age Groups

AGE GROUP	APRIL 2000	2005	ABSOLUTE CHANGE IN POPULATION	PERCENT CHANGE, MASSACHUSETTS	PERCENT CHANGE, U.S.	MASSACHUSETTS RANK AMONG 50 STATES
All	6,349,097	6,398,743	49,646	0.8	5.3	48th
Under 18	1,500,064	1,458,036	-42,028	-2.8	1.6	30th
18 and Older	4,849,033	4,940,707	91,674	1.9	6.6	50th

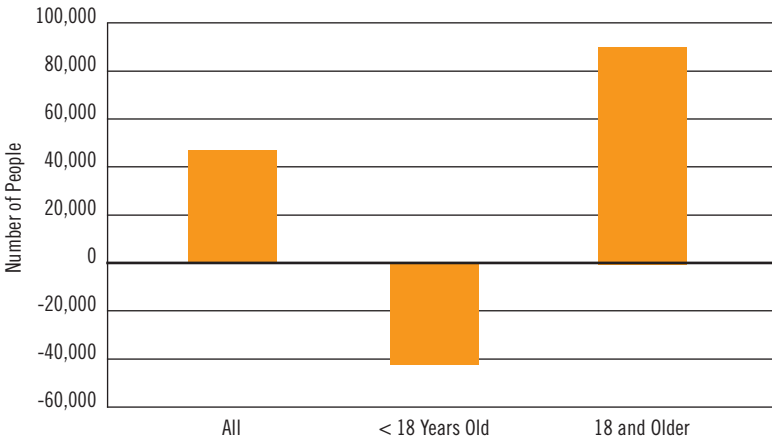
Source: U.S. Census Bureau, "Estimates of the Resident Population of Statues, 2000 to 2005".

age groups. Table 15 presents recently-released U.S. Census Bureau estimates of changes in the resident population of the state between 2000 and 2005 in two age groups: those under 18 and 18 and older.

Over the April 2000/July 2005 period, the total resident population of the state is estimated to have increased by slightly under 50,000 or .8 percent. The population under 18, however, is estimated to have declined from 1.500 million in April 2000 to 1.458 million in July 2005, a drop of 42,000 or 2.8% (Chart 12). In comparison, the population under 18 in the U.S. rose by 1.6% over this same five year period. Massachusetts was not the only state to experience a decline in its under 18 population. Thirty other states also experienced a drop in this age group. Massachusetts ranked 30th among the 50 states on the growth rate of its under 18 population over the 2000-2005 period.

Chart 12:

Growth in the Resident Population of Massachusetts Between 2000 and 2005, All and Selected Age Groups



The drop in the under 18 population of the state is attributable to two different sets of demographic forces. First, the number of live births in Massachusetts declined steadily and sharply from 1990 to 1996 and has hovered in a very narrow range since then. In 1990, there were 92,461 births in Massachusetts.[5] Over the following six years, the number of births in Massachusetts fell steadily, declining to 80,164 in 1996, a drop of approximately 12,300 or slightly more than 13 percent. Between 1996 and 2004, the number of births has fluctuated between 80,100 and 81,600. The fertility rate among women ages 15-44 in Massachusetts during 2003 was only 57.2 per 100, well below the national average of 66.1, and Massachusetts women ranked fourth lowest on this fertility measure.[6] Second, more children and teenagers have left the state than have come into Massachusetts in recent years. Findings of the 2004 American Community Surveys revealed that the number of persons under 16 who left the state in 2004 exceeded the number who came into the state by 14,370 (Table

16). This finding clearly implies that Massachusetts' families with children are leaving the state in sizable numbers, reducing the future size of the state's young adult population with its adverse consequences for future labor force growth.

The number of state residents 18 and older rose by just under 92,000 or nearly 2 percent between 2000 and 2005 (Table 15). This rate of growth, however, was less than one-third as high as the national growth rate for this age group (6.6%), and *Massachusetts ranked last among the 50 states on this population growth measure*. The weak rate of growth in the 18 and older population was attributable in large part to high levels of domestic out-migration. During 2004, the number of persons 16 and older leaving Massachusetts to move to other states exceeded the number of persons 16 and older moving into Massachusetts from other states by 60,500 (Table 15). Net out-migration was particularly large among 16-24 year old and 35-54 year olds.[7] Net out-migration of the elderly population (65 and older) was quite small, only -3,500 in 2004. The state was primarily losing adults in their prime-aged working years (20-54) rather than retirees. As will be noted below, the age and educational composition of out-migrants in recent years has had negative impacts on the size of the resident labor force.

Estimates of the size of the working-age (16 and older), civilian, non-institutional population of Massachusetts and the U.S. from 2000-2005 are displayed in Table 16. This population estimate excludes all inmates of institutions, such as jails, prisons, nursing homes, and mental institutions. Over this five-year period, the working-age population of the state is estimated to have increased from 4.933 million to 5.027 million, a gain of 94,000 or 1.9%. This rate of growth was only 30 percent as high as that for the nation (6.4%) over the same time period. The bulk of the growth in the state's working-age population took place between 2000 and 2002. Over the following three years, the working-age population of Massachusetts increased by only 19,000 or less than 0.4 percent, only one-tenth as high as the growth rate of the nation's working-age population over the 2002-2005 period. Over this latter three year period, Massachusetts captured only 0.2% of the growth in the nation's working-age population an extraordinarily low share.

Table 16:

Characteristics of Domestic In and Out Migrants from Massachusetts by Age Group, 2004

AGE GROUPS	IN-MIGRANTS	OUT-MIGRANTS	NET DOMESTIC OUT-MIGRATION
Under 16	13,630	28,000	-14,370
16 and Older	79,978	140,517	-60,539
16-24	19,946	35,043	-15,897
25-34	36,875	41,327	-4,452
35-54	14,383	43,446	-29,033
55-64	4,297	11,935	-7,638
65+	4,477	7,996	-3,519
Total	93,608	168,517	-74,909

Table 17:

Trends in the Civilian Non-institutional Working-Age Population of Massachusetts and the U.S., 2000-2005 (Annual Averages in 1000s)

TIME PERIOD	MASSACHUSETTS	U.S.
2000	4,933	212,577
2001	4,986	215,092
2002	5,008	217,570
2003	5,023	221,168
2004	5,025	223,357
2005	5,027	226,082
Absolute Change, 2000-2005	94	13,505
Percent Change, 2000-2005	1.9%	6.4%
Percent Change, 2002-2005	0.4%	3.9%

Sources: (i) U.S. Bureau of Labor Statistics, "CPS Household Statistics," Monthly Labor Reviews, selected years. (ii) Massachusetts Department of Workforce Development, "LAUS Statistics", web site.

The Educational Characteristics and Labor Force Behavior of Domestic In and Out Migrants into Massachusetts in Recent Years

The labor force consequences of domestic in and out migration are dependent upon the age and educational characteristics of the members of both groups and their attachment to the labor market. The above findings have revealed that a very high share of the domestic out-migrants were of working-age, and most of those were in the prime-age group of 20-54 year olds. In Table 18, we identify the educational characteristics of working-age in and out domestic migrants in 2004. Each domestic migrant was assigned to one of five educational attainment subgroups, ranging from those lacking a high school diploma/GED certificate to those holding a Bachelor's or more advanced degree. In each educational subgroup, the number of out-migrants exceeded the number of in-migrants from other states (Table 18). Among those adults with no post-secondary schooling, the number of out-migrants exceeded in-migrants by a margin of more than two to one (39,800 versus 18,500). An earlier study by MassINC on state residents' perceptions of the quality of life in Massachusetts had revealed that persons who classified themselves as "working class" were most likely to consider moving out of the state.[8] Most of these "working class" residents had not completed any schooling beyond high school.

THE STATE LOST, ON NET, 18,000 RESIDENTS WITH A BACHELOR'S DEGREE

Adults with one or more years of post-secondary schooling also were more likely to move out of the state between 2003 and 2004 than to move into Massachusetts. Even among those with a Bachelor's or more advanced degree, out-migrants exceeded in-migrants by nearly 18,000 (Table 18). The labor force impacts of out-migration among Bachelor degree holders were even greater than suggested by the population counts alone. A relatively high fraction (40%) of the in-migrants with bachelor degrees were enrolled in graduate or professional school in Massachusetts and were not employed, while only 15 percent of the bachelor degree recipients who left the state were enrolled in graduate school elsewhere. Thus, Massachusetts loses more college-educated adults who are strongly attached to the labor market while it gains more well-educated young adults who come here to obtain post-Bachelor degrees. Whether they will remain here after obtaining graduate degrees is not known. The net effect of this differential labor force behavior is to shrink the size of the resident labor force of the state.

To estimate the immediate labor force and employment consequences of domestic in and out-migration from Massachusetts in recent years, we identified the labor force and employment status of all working age domestic migrants into and out of Massachusetts during 2003 and 2004. The American Community Surveys for 2003 and 2004 were used to generate these estimates. The findings from the 2003 ACS surveys reveal a very large negative effect of domestic migration on the

Table 18:

Characteristics of Working-Age In and Out-Migrants from Massachusetts by Educational Attainment, 2004

EDUCATIONAL ATTAINMENT	IN-MIGRANTS	OUT-MIGRANTS	NET DOMESTIC OUT-MIGRATION
<12 or 12, no diploma	4,765	12,609	-7,844
H.S. diploma/GED	13,768	27,195	-13,427
1-3 years of college	13,917	35,256	-21,339
B.A. degree	29,258	40,754	-11,496
Master's or higher	18,270	24,703	-6,433

Source: 2004 American Community Surveys, public use files.

size of the resident labor force and employed population. The number of out-migrants who were active participants in the labor force in another state was 50,000 greater than the number of in-migrants, and employed out-migrants exceed employed in-migrants by more than 40,000 (Table 19).[9] Very similar findings prevailed in 2004. While the labor force participation rates of the two groups were nearly identical, in 2004 the number of out-migrants who were attached to the labor force in their new state of residence exceeded the number of in-migrants who were active members of the labor force in Massachusetts by nearly 45,000. Net out-migration from Massachusetts during the 2003-2004 period reduced the size of the resident labor force by nearly 95,000. These large losses were partly offset by a continued influx of new immigrant workers into the state.

Table 19:

Labor Force and Employment Status of Domestic Working-Age Migrants Into and Out of Massachusetts, 2003 and 2004

	2003	2004
In-migrants		
In labor force	56,372	57,421
Employed	49,857	51,643
Labor force participation rate		61.3%
Out-migrants		
In labor force	106,259	102,361
Employed	90,174	85,420
Labor force participation rate		60.8%
Net migration		
In labor force	-49,887	-44,940
Employed	-40,317	-33,777

Source: 2003 and 2004 American Community Surveys, public use files, tabulations by authors.

Changes in the Population of Massachusetts by County, 2000-2005, and the Geographic Sources of Net Domestic Out-Migration

How did population growth in the state vary across geographic areas of the state over the past five years? To answer this question, we examined recently-released U.S. Census Bureau estimates of the resident population of each of the 14 counties as of July 2005. The 2005 population estimates by county are compared to those at the time of the 2000 Census to identify the level and rate of population growth within each county over the 2000-2005 period.

Population growth rates of the state's 14 counties varied quite widely over the past five years. The estimated changes in the resident population of these counties ranged from lows of -5% in Suffolk County and -2.3% in Berkshire county to highs of 4% to nearly 7% in Dukes, Plymouth, Worcester, and Nantucket Counties (Table 20).[10] Three counties, including Suffolk and Middlesex, experienced population losses, and two other counties (Norfolk and Hampshire) are estimated to have grown by less than one percent. On the upper end of the growth rate distribution, four counties, including the two Island counties of Dukes and Nantucket, increased their population by 4 to 7 percent with Plymouth and Worcester Counties combined adding nearly 52,000 residents over the past five years. Both Worcester and Plymouth County appear to have experienced population growth as a result of families moving out of higher priced housing markets in the Greater Boston area to take advantage of more affordable housing.[11]

Three of the large counties in eastern Massachusetts that make up a major part of the Boston metropolitan area either experienced population declines or grew very slowly over the past five years. Both Suffolk and Middlesex Counties lost

Table 20:

Resident Population Change Between 2000 and 2005 in Massachusetts by County

COUNTY	2000 CENSUS	JULY 2005	ABSOLUTE CHANGE	RELATIVE CHANGE
Massachusetts	6,349,097	6,398,743	49,646	0.78
Nantucket	9,520	10,168	648	6.81
Worcester	750,963	783,262	32,299	4.30
Plymouth	472,822	492,409	19,587	4.14
Dukes	14,987	15,592	605	4.04
Bristol	534,678	546,331	11,653	2.18
Essex	723,419	738,301	14,882	2.06
Barnstable	222,230	226,514	4,284	1.93
Hampden	456,228	461,591	5,363	1.18
Franklin	71,535	72,334	799	1.12
Hampshire	152,251	153,339	1,088	0.71
Norfolk	650,308	653,595	3,287	0.51
Middlesex	1,465,396	1,459,011	-6,385	-0.44
Berkshire	134,953	131,868	-3,085	-2.29
Suffolk	689,807	654,428	-35,379	-5.13

Source: U.S. Census Bureau, "2005 Population Estimates of States by County"

population, and Norfolk County's resident population is estimated to have grown by only 3,287 or 0.5%. The combined population of these three counties declined by 38,500 between 2000 and 2005. To identify the potential role of domestic out-migration in contributing to the population declines in these counties and the remainder of the Boston metropolitan statistical area, we examined estimates of net domestic migration for the Boston metro area[12] and the state of Massachusetts for the 2000-2004 time period (Table 21).

Between 2000 and 2004, net domestic migration from the Boston metropolitan area was estimated at slightly over –167,000. The Boston metro area accounted for nearly all (99%) of the net domestic out-migration in the state. The annual rate of net domestic migration was 9.5 per 1,000, or just under 1 per 100. The Boston metropolitan area ranked 3rd highest among the 25 most populous metro areas in the nation on its annual average rate of net out-migration, exceeded only by San Francisco and New York.[13] The high level and rate of out-migration from the Boston metro area is the key factor holding down the growth of the state's population and is also contributing to the absence of labor force growth in the state. Between 2001 and 2005, the resident labor force of Essex, Norfolk, Middlesex, and Suffolk Counties are estimated to have declined by anywhere from 1.5% (Essex) to nearly 6% in Suffolk County. The combined decline in the labor force of these four counties was equal to just under 58,000 over this four year period. Knowledge of the demographic characteristics and labor force behaviors of the out-migrants from these counties and the entire Boston metro area is critical to understanding the sources of the decline in the labor force of the state over the past three years.

Table 21:

Estimates of Domestic Net Migration in the Boston Metropolitan Area and the State of Massachusetts, 2000 to 2004

GEOGRAPHIC AREA	NET DOMESTIC MIGRATION, 2000-2004	ANNUAL AVERAGE RATE (PER 1000)	RANK AMONG 25 LARGEST METRO AREAS OR 50 STATES
Boston Metro Area	-167,404	-9.5	3rd Highest
State of Massachusetts	-169,606	-6.6	2nd Highest

Source: U.S. Census Bureau, "Domestic Net Migration in the United States: 2000-2004," tabulations by authors.

The Educational Characteristics of the Massachusetts Working-Age Population and Its Labor Force in 2003

The aggregate size of the labor force of a state and its average quality will be influenced by the formal educational attainment and literacy/ numeracy proficiencies of its working-age adults. The educational attainment and literacy/ numeracy proficiencies of adults have strong independent impacts on their labor force participation behavior, their ability to obtain paid employment when they do seek work, their annual hours of work, their access to highly skilled occupations, and their weekly and annual earnings.[14] The educational attainment and occupational skills of workers in state and local economies also have been found to influence the level of aggregate real output (Gross State Product), labor productivity, and the growth rates of real output, real income per capita, and real earnings.[15] The literacy, math, and science proficiencies of a country's population, including the proficiencies scores of the average adult in the nation, have been found to significantly influence the growth rate of their countries' real output levels.[16]

Given its lower abundance of natural resources, Massachusetts has been more dependent on the human capital of its workforce to achieve economic growth than most other states, and the educational skills and quality of its workforce have frequently ranked very high among the states.[17] To identify the recent educational attainment of the state's working-age population and its civilian labor force and to place those findings in comparative perspective, we examined the findings of the 2003 American Community Surveys for Massachusetts and the U.S. Key findings of our analysis are displayed in Tables 22 and 23. During 2003, Massachusetts had a below average share of its working-age population in the under 12 years of schooling and high school graduate only categories (Table 22). Massachusetts also had a lower share of its population completing 1 to 3 years of college in 2003 than the nation as a whole (24.6% vs. 27.4%). At the upper end of the educational attainment distribution, however, Massachusetts had an above average share of its residents with a Bachelor's degree (19 vs. 15 percent for the nation) and a Master's or higher degree (13 vs. 8 percent). Nearly 1 of every 3 Massachusetts residents of working-age held a Bachelor's or higher degree in 2003 versus only 23 percent of U.S. residents. Massachusetts ranked very high among the 50 states on the following three measures of educational attainment: 3rd highest on the share of its working-age population with one or more years of post-secondary schooling, highest on the share of its population with at least a Bachelor's degree, and highest on the share of its

MASSACHUSETTS IS DEPENDENT ON THE HUMAN CAPITAL OF ITS WORKFORCE TO ACHIEVE ECONOMIC GROWTH

Table 22:

The Working-Age Population (16+) of Mass. and the U.S., 2003

EDUCATIONAL ATTAINMENT	U.S.	MA	MA – U.S.
<12 or 12, no diploma/GED[1]	19.8	15.1	-4.7
H.S. diploma/GED	29.3	27.4	-1.9
13-15 years	27.4	24.6	-2.8
Bachelor's degree	15.2	19.5	+4.3
Master's or higher	8.2	13.4	+5.2

Source: 2005 monthly CPS surveys, public use files, tabulations by authors. Note: (1) This educational attainment group includes students 16 and older who are still enrolled in high school.

Table 23:

Massachusetts Working-Age Population in Selected Educational Attainment Groups, 2003

EDUCATIONAL ATTAINMENT	PERCENT OF POPULATION	MASSACHUSETTS RANKING AMONG THE 50 STATES
13 or more years	57.5	Tied 3rd (Minnesota)
Bachelor's or higher degree	32.9	1st
Master's or higher degree	13.4	1st

Source: 2003 American Community Surveys, public use files, tabulations by authors.

Table 24:

The Percent Distribution of the U.S. and Massachusetts Civilian Labor Force by Educational Attainment, 2003

EDUCATIONAL ATTAINMENT	U.S.	MA	MA – U.S.
<12 or 12, no diploma/GED	13.6	9.5	-4.1
H.S. diploma/GED	28.7	25.6	-3.1
13-15 years	30.1	26.3	-3.8
Bachelor's degree	17.9	22.7	+4.8
Master's or higher	9.7	15.9	+6.2

Source: 2003 monthly CPS surveys, public use files, tabulations by authors.

Table 25:

Massachusetts' Share of Its Civilian Labor Force in Selected Educational Attainment Groups, 2003

EDUCATIONAL ATTAINMENT	PERCENT OF POPULATION	MASSACHUSETTS RANKING AMONG THE 50 STATES
13 or more years	64.9	Tied 1st (Washington)
Bachelor's or higher degree	38.6	1st
Master's or higher degree	15.9	1st

Source: 2003 American Community Surveys, public use files, tabulations by authors.

working-age population with a Master's or higher degree (Table 23). The state, thus, had achieved a number one ranking with respect to the share of its working-age population with four-year or higher college degrees.[18]

The 2003 ACS surveys also collected information on the labor force status of working-age respondents at the time of the survey. The educational attainment backgrounds of all civilian labor force participants in Massachusetts and the U.S. were examined (Table 24). Similar to the findings for the working-age population, Massachusetts had a below average share of its labor force in the three lower educational attainment subgroups: those lacking a high school diploma/GED certificate, those with a high school diploma but no completed years of post-secondary schooling, and those with one to three years of college, including Associate degrees. The state had a considerably higher share of its labor force with a Bachelor's or higher degree. Nearly 39 of every 100 civilian labor force participants in the state held a Bachelor's or higher degree versus slightly under 28 percent in the nation. The state ranked highest among the 50 states on this educational attainment measure.[19] (Table 25). Approximately 16 percent of the labor force participants in our state in 2003 held a Master's or higher degree versus less than 10 percent of the U.S. labor force. Massachusetts ranked first among the 50 states on this measure of human capital in 2003. On each of the three human capital measures capturing the post-secondary educational credentials of the members of the labor force in 2003, Massachusetts ranked first among the 50 states. This represents a major accomplishment for our state. However, as will be revealed in a following section on the labor force behavior of state residents, our state did not rank among the very highest in the participation rates of per-

sons in each of these educational attainment subgroups. There is considerable room for improving the labor force attachment of most educational subgroups of the state's working-age population.

The Rise in the Immigrant Population and Its Contribution to Labor Force Growth in Massachusetts

Over the past few decades, the nation and the state have experienced rising inflows of new immigrants from an increasingly diverse array of nations. In Massachusetts, new immigrants generated all of the net population growth taking place in the state during the 1970s, 1980s, and 1990s.[20] For example, between 1990 and 2000, the resident population of Massachusetts increased by 332,672. The number of foreign immigrants residing in Massachusetts at the time of the 2000 Census who had arrived in the U.S. between 1990 and 2000 was estimated to be slightly over 350,000, accounting for 105 percent of the net increase in the state's resident population over the decade.[21]

As noted above, net international migration (immigrants – emigrants) into the state between 2000 and 2005 accounted for more than all of the increase in the state's population over this five year period. Findings of our analysis of the CPS household survey data for 2005 revealed that there were 192,809 immigrants residing in the state who had arrived in the U.S. between 2000 and 2005. Thus, these new immigrant arrivals accounted for 521% of the increase in the resident population of the state over the 2000-2005 period (Table 26). The state's population clearly would have declined over the past five years in the absence of new immigrant inflows.

New immigrants have accounted for a substantially increasing share of labor force growth in the state over the past few decades. During the 1970s, new immigrants generated only 15 percent

Table 26:

Changes in the Resident Population of Massachusetts Between 2000 and 2005 and the Number of New Immigrants Residing in the State in 2005 (Numbers in 1000s)

POPULATION, JULY 2000	POPULATION, JULY 2005	CHANGE 2000-2005	NEW IMMIGRANTS IN STATE IN 2005	NEW IMMIGRANTS AS PERCENT OF POPULATION CHANGE
6,362	6,399	37	193	521%

Table 27:

New Foreign Immigrants' Contribution to Labor Force Growth in Massachusetts, Selected Time Periods, 1970 to 2005

TIME PERIOD	CIVILIAN LABOR FORCE GROWTH	NUMBER OF NEW IMMIGRANTS IN LABOR FORCE AT END OF TIME PERIOD	NEW IMMIGRANTS' SHARE OF LABOR FORCE GROWTH
1970-1980[1]	427,000	63,1003	15%
1980-1990[1]	429,600	151,000	35%
1990-2000[1]	66,050	184,000	278%
2000-2005[2]	43,600	120,800	276%

Sources: (1) U.S. Census Bureau, Censuses of Population and Housing, 1970, 1980, 1990, and 2000; (2) U.S. Bureau of Labor Statistics, Current Population Surveys, 2000 and 2005, tabulations by authors; (3) New immigrant figures for 1980 exclude persons born in Puerto Rico or one of the other outlying territories of the U.S. They were not separately identified on the 1980 public use file.

of the state's labor force growth as the post-World War II baby boom generation entered the labor force in large numbers and women strongly increased their rate of labor force attachment (Table 27). In the 1980s, 35 percent of the state's resident labor force growth was attributable to new immigrants. During the 1990s, new immigrants were responsible for well over 100 percent of the growth in the state's labor force. In the absence of these new immigrant workers, the state's labor force would have shrunk, despite high levels of payroll job growth, rising real wages from 1994 onward, and record low unemployment by the end of the decade.

NEARLY 1 OF EVERY 3 MASSACHUSETTS RESIDENTS OF WORKING-AGE HELD A BACHELOR'S DEGREE OR HIGHER

New immigrants have continued to produce more than all of the labor force growth in the state over the past five years. In 2005, there were 121,000 new immigrants actively participating in the state's civilian labor force (Table 27). Yet, the CPS survey findings indicate that the state's resident labor force grew by only 43,000 over the same five year period.[22] Thus, new immigrant accounted for 276% of the net change in the civilian labor force of the state between 2000 and 2005.

Table 28:

The Age Distribution of New Foreign Immigrant Arrivals in Massachusetts Between 2000 and 2005

AGE GROUP	NUMBER	PERCENT OF ARRIVALS
All	192,809	100.0
Under 16	27,084	14.0
16 and Older	165,725	86.0
• 16-24	36,283	18.9
• 25-34	80,251	41.6
• 35-54	41,111	21.3
• 55+	8,080	4.2

Source: 2005 monthly CPS surveys, public use files, tabulations by authors.

The continued large impact of new immigrant arrivals on labor force growth in the state appears to be attributable to several different factors. First, a substantial majority of the 192,809 new immigrant arrivals over the past five years were of working-age. Approximately 6 of every 7 new immigrant arrivals over the past five years were 16 or older (Table 28). Second, a very high share of these new immigrant arrivals were in the young working-age groups. Slightly more than 6 of 10 new immigrants were between the ages of 16-34. Very few immigrants (only 4%) were 55 and older, a group with a below average labor force participation rate. Third, the labor force participation rate among working-age, new immigrants, especially males, was quite high.[23] In 2005, the civilian labor force participation rate of new immigrants was nearly 73%, six percentage points above that of the native born and established immigrants, i.e., those immigrants who arrived in the U.S. prior to 2000. The labor force participation rate of new, male immigrants was a remarkably high 86.6%, more than 14 percentage points above that of native born males (Table 29).

As a consequence of their high share of working-age individuals, their concentration in the younger adult age groups (16-34), and the very high participation rate of male immigrants, the new wave of immigrant arrivals contained a very large number of labor force participants (120,800). During this time period, according to the findings of the CPS household surveys, the state's resident civilian labor force only grew by 43,000 (Table 27).[24] Thus, new immigrants accounted for 276% of the change in the state's resident labor force over the 2000-2005 period. The number of native

born and established immigrant adults in the labor force of the state declined by at least 77,000 over this five year period, with the bulk of this reduction taking place among men. Recent research findings by CLMS staff reveal that a portion of the gains in employment among new immigrant arrivals in the U.S. and many states came at the expense of native born workers, especially young adult males under 35 with no substantive post-secondary schooling.[25]

The new immigrant arrivals in Massachusetts are quite heterogeneous with respect to their educational attainment and their English-speaking proficiencies. Analysis of the 2004 ACS survey data revealed that approximately 1 of 5 working-age new immigrants failed to complete high school while another 39 percent claimed to hold a Bachelor's or higher degree.[26] New immigrants in Massachusetts were considerably better educated than their peers across the entire nation, being 50 percent more likely to have obtained a Bachelor's or higher degree (39% vs. 26%). Yet, many of the adult immigrants (18 and older) in Massachusetts reported that they either did not speak English at all or did not speak it well. There is a clear need for ESOL instructional services among a high share of these new immigrant arrivals to bolster their English-speaking proficiencies which significantly influence their access to more highly skilled and higher wage position.

Table 29:

The 2005 Civilian Labor Force Participation Rates of the Native Born, Established Immigrants, and New Immigrants in Massachusetts, Total and by Gender (Annual Averages in percent)

GROUP	ALL	MEN	WOMEN
Native Born	66.9	72.2	61.9
Established Immigrants	67.0	75.9	59.4
New Immigrants	72.9	86.6	60.4
New Immigrants – Native Born	+6.0	+14.4	-1.5

Source: 2005 CPS monthly household surveys, public use files, tabulations by authors.

Endnotes

1. In the 1960s, the working-age population was typically defined as the population 14 and older. Beginning with the 1970 Census, the U.S. Census Bureau only collected labor force data from the population 16 and older. The CPS survey followed suit in the 1970s based on recommendations of a Presidential advisory committee on labor market statistics known as the Gordon Committee.
2. For a more comprehensive review of population developments in Massachusetts during the 1990s, *See*: Andrew Sum, Anwiti Bahuguna, et.al., *The Road Ahead: Emerging Threats to Workers, Families, and the Massachusetts Economy*, Teresa and H. John Heinz Foundation and the Massachusetts Institute for A New Commonwealth, Boston 1998.
3. The state population estimates of the U.S. Census Bureau are centered on July 1 of each year.
4. One has to be cautious in drawing conclusions about the net impact of foreign immigration on population change in the state from the gross total inflows. Since national research does suggest that the arrival of new foreign immigrants into a metropolitan area does lead to out-migration of some native born residents and reduced in-migration of native born persons. The relationship is far from being, one-to-one, however. *See*: George J. Borjas, "Native Internal Migration and the Labor Market Impact of Immigration", *The Journal of Human Resources*, Spring 2006, Volume 41, No. 2, pp. 221-258.
5. The number of births is based on a complete count of all live births to Massachusetts residents as compiled by the vital statistics program of the state.
6. The fertility rate is defined as the number of births per 1,000 women ages 15-44. The three states with lower fertility rates than Massachusetts were all in New England (New Hampshire, Rhode Island, Vermont).
7. Out-migration of 16-24 year olds is likely somewhat exaggerated by the ACS survey due to its treatment of persons living in group quarters such as college dormitories and fraternities/sororities. The ACS survey does not interview persons in group quarters. Thus, a young adult who moved from another state to attend college in Massachusetts in 2004 and lived in a college dormitory would have not been counted by the 2004 ACS survey in Massachusetts.
8. *See*: Princeton Survey Research Associates, *The Pursuit of Happiness: A Survey on the Quality of Life in Massachusetts*, Massachusetts Institute for A New Commonwealth, Boston, 2003.
9. It should be noted that the unemployment rate of out-migrants in both years was quite high. It was 15% in 2003 and 17% in 2004, indicating that a number of out-migrants were experiencing difficulties in finding employment in their new state of residence.

10. The city of Boston has argued that its population, which dominates that of Suffolk County, has been under-estimated by the U.S. Census Bureau. The city claims that the number of housing units in the city has been undercounted, and our own analysis of residents of group quarters, including college students living in dormitories, seems to have been undercounted.

11. *See*: Lisa Eckelbecker, "Forecast for the Future: Worcester–Area Planners are Looking Ahead," *Worcester Telegram and Gazette, April 23, 2006*.

12. The boundaries of the Boston Metropolitan Statistical Area are those of the federal government's Office of Management and Budget as of November 2004. The metro area includes all of the NECTA Divisions in Eastern Massachusetts from Lynn, Salem, Lowell, and Lawrence in the north to Brockton and Taunton in the south but exclude New Bedford and Fall River.

13. The Boston metropolitan area's comparative position on net domestic migration deteriorated over the past four years. In the 1990s, Boston ranked only 8th highest among the 25 most populous metro areas on its net domestic out-migration rate but moved to third highest over the 2000-2004 period.

14. *See*: (i) Richard J. Murnane and Frank Levy, *Teaching the New Basic Skills*, The Free Press, New York, 1996; (ii) Andrew Sum, *Literacy and the Labor Force*, National Center for Education Statistics, Washington, D.C, 1999; (iii) Andrew Sum, Irwin Kirsch, and Kentaro Yamomoto, *Pathways to Labor Market Success: The Literacy Proficiency of U.S. Adults*, Policy Information Center, Educational Testing Service, Princeton, 2004.

15. For findings on the impact of the schooling and occupational skills of a state's and metropolitan area's workforce on its aggregate output level, real income per capita, and labor productivity, *See*: (i) Andrew Sum, Donna Desrochers, and Neal Fogg, *Modeling State GSP Performance: An Aggregate Production Function Approach*, Paper Presented to the Eastern Economic Association, Boston, March 1996; (ii) Randall W. Eberts, George Erickcek, and Jack Kleinhenz, "Development of a Regional Economic Dashboard," *Upjohn Institute for Employment Research*, Kalamazoo, July 2006.

16. *See*: (i) Eric Hanushek and Dennis D. Kimko, Schooling, Labor Force Quality, and the Growth of Nations," *American Economic Review*, Vol. 90, December 2000, pp. 1184-1208; (ii) Serge Coulombe, Jean-Francois Tremblay, and Sylvia Marchand, *Literacy Scores, Human Capital, and Growth Across Fourteen OECD Countries*, Statistics Canada, June 2004.

17. *See*: (i) John D. Donahue, Lisa M. Lynch, Ralph Whitehead, *Opportunity Knocks: Training the Commonwealth's Workers for the New Economy*, Mellon New England/Arthur F. Blanchard Trust and the Massachusetts Institute for a New Commonwealth, Boston, 2000; (ii) Robert B. Atkinson, et. al., *The State New Economy Index*, Progressive Policy Institute, July 1999.

18. Findings of the 2005 monthly CPS household surveys yielded very similar findings. Thirty-four percent of the state's working age residents reported holding a Bachelor's or higher degree versus 25% for the U.S. Massachusetts again ranked first among the 50 states on this measure.

19. The District of Columbia actually ranked highest on this measure with 48% of its 2003 labor force holding a Bachelor's or higher degree; however, DC adults with 12 or fewer years of schooling had very low rates of labor force attachment in 2003, artificially raising the share of its labor force with a Bachelor's or higher degree.

20. A "new immigrant" is a foreign immigrant residing in Massachusetts at the time of a given Census; e.g. 1990, who arrived in the U.S. in the prior decade. For a review of the evidence on this issue and the demographic / human capital characteristics of new immigrants in Massachusetts in the 1980s and 1990s, *See*: (i) Andrew M. Sum, W. Neal Fogg, et.al., *The Changing Workforce: Immigrants and the New Economy in Massachusetts…*; (ii) Andrew Sum, Johan Uvin, Dana Ansel, *The Changing Face of Massachusetts*, especially pages 24-27.

21. Our definition of immigrants includes persons born in Puerto Rico and the outlying territories of the United States since their arrival in the U.S. adds to the population of the U.S. just as an immigrant from another country.

22. The CPS surveys yield a higher level of labor force growth between 2000 and 2005 than the LAUS surveys, which indicate no growth in the state's labor force.

23. For a more detailed overview of the labor force behavior of new immigrants in Massachusetts, *See*: Andrew Sum, Ishwar Khatiwada, Paulo Tobar with Sheila Palma, *New Foreign Immigrant Inflows into Massachusetts, 2000-2005: An Assessment of Their Size, Characteristics, and Impacts on State Population and Labor Force Growth*, Report Prepared for the Commonwealth Corporation, Boston, March 2006.

24. The LAUS program for the state shows no labor force growth over this five year period.

25. *See*: Paul Harrington and Andrew Sum, "As Jobs Go Off the Books, Immigrants Edge Out Some Native-Born Workers," *CommonWealth*, Winter 2006, pp. 83-90.

26. *See*: Andrew Sum, Ishwar Khatiwada, et.al., *New Foreign Immigrant Inflows into Massachusetts, 2000-2005*.

IV. TRENDS IN LABOR FORCE PARTICIPATION RATES

Trends in Overall Civilian Labor Force Participation Rates in Massachusetts, 1978-2005

The second set of variables influencing the growth of a state's resident labor force over time is the labor force participation rates of its working-age residents (16 and older). Changes in the degree of attachment to the labor force by working-age residents will have independent effects on labor force growth. Trends in the annual average civilian labor force participation rates of the Massachusetts working-age population (16 and older) from 1978 to 2005 are displayed in Table 30. In the late 1970s, the overall participation rate of the state averaged slightly under 66%, implying that nearly two out of every three working-age adults in the state were either working or actively looking for work during an average month. During the 1980s, annual average participation rates in our state rose as a consequence of continued steady increases in the labor force attachment of women. By 1989, the state's civilian labor force participation rate reached close to 69%, the all time high for Massachusetts. During the 1990s, however, the state's participation rate drifted downward as women's rate of participation leveled off and male participation declined. By calendar year 2000, the state's participation rate was estimated by the CPS surveys to have fallen to 67.4% and would drop slightly below 67% in 2005.

Massachusetts' labor force participation rates exceeded those of the nation throughout the entire 1978-2005 period, but the absolute size of the state's participation rate advantages over the nation declined over this period. In 1979 and again in 1988 and 1989, the state's participation rate exceeded that of the nation by 2.5 percentage points. During 2000, the state's advantage had declined to only 0.2 percentage points (a statistically insignificant difference), and it was under one percentage point in 2005. While the participation rates of Massachusetts have exceeded the U.S. average, our state has not been among the top ten states on this labor force activity measure over the past 30 years, and our relative ranking has deteriorated since the late 1990s. Our best performance over this 28 year time period was in 1979 when the state ranked 16th highest among the 50 states. At the end of the 1980s, the state's rank was 19th highest, but it then deteriorated during the 1990s, falling to 32nd place in 2000 and only ranking 30th in 2005, far behind the top ten states on this key measure of labor force activity.

THE SHARE OF MEN PARTICIPATING IN THE LABOR FORCE HAS DECLINED

To place the state's 2005 civilian labor force

Table 30:

Trends in the Civilian Labor Force Participation Rates of Persons (16+) in Massachusetts and the U.S., Selected Years, 1978 to 2005 (Annual Averages, in percent)

YEAR	MA	U.S.	MA – U.S.	RANKING AMONG 50 STATES
1978	65.5	63.2	+2.3	18th (tie)
1979	66.2	63.7	+2.5	16th (tie)
1980	65.6	63.8	+1.8	19th (tie)
1988	68.4	65.9	+2.5	21st
1989	68.9	66.4	+2.5	19th
1995	67.9	66.6	+1.3	25th
2000	67.4	67.2	+0.2	32nd
2004	67.5	66.0	+1.5	19th
2005	66.9	66.0	+0.9	30th

Sources: (i) U.S. Bureau of Labor Statistics, Geographic Profile of Employment and Unemployment, selected years 1978 to 2000; (ii) Monthly CPS public use files, 2005, tabulations by authors.

participation rate in comparative perspective, we have displayed the 2005 labor force participation rates of the top five and bottom five performing states together with that for our state in Chart 13. The labor force participation rates of the top five states ranged from 72.4% in Alaska to 73.6% in Nebraska with an average of 73.0%. The Massachusetts participation rate of 66.9% was slightly more than six percentage points below the average for the top five states. In contrast, the bottom five states had labor force participation rates ranging from 62.9% in Florida to a low of 55.4% in West Virginia, with an average of 60.8% (Chart 13). Massachusetts' 2005 labor force participation rate was six percentage points above the average of the bottom five performing states in the nation. A very large gap (12.2 percentage points) prevailed between the average participation rates of the top five and bottom five states in the country.

Chart 13:

Civilian Labor Force Participation Rates of Persons (16+) in Massachusetts and the Top Five and Bottom Five States in 2005 (Annual Averages in percent)

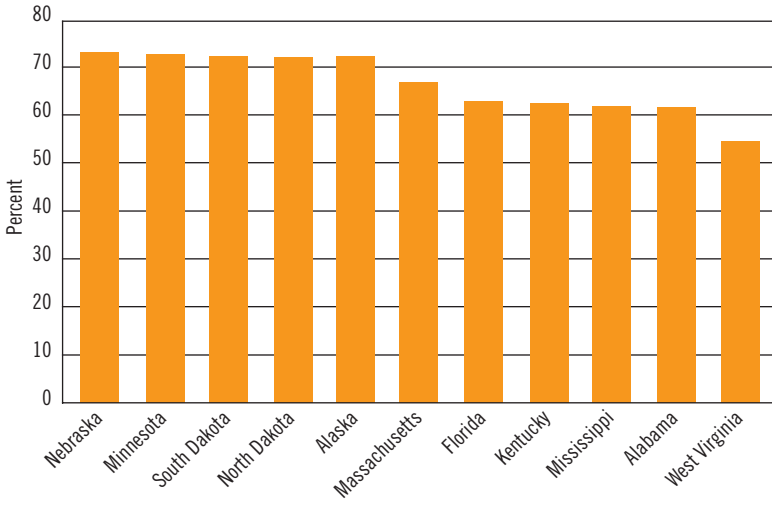
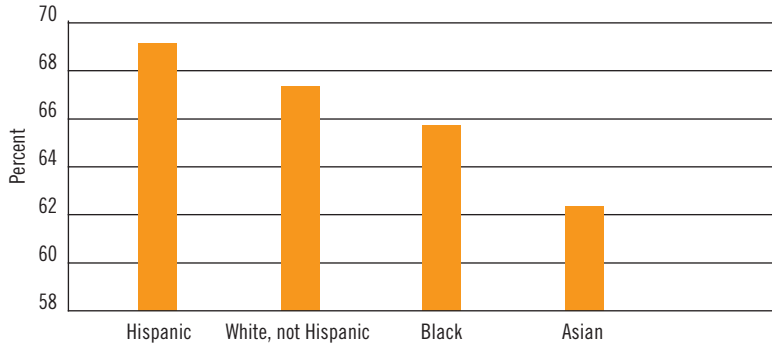


Chart 14:

Civilian Labor Force Participation Rates of Working-Age Residents in Massachusetts by Race-Ethnic Group, 2004-2005 Averages



The findings in Chart 13 clearly suggest that Massachusetts could boost the size of its resident labor force considerably by becoming more of a national leader on its participation rate. This goal would seem to be both a feasible and economically desirable one. Not one of the top five performing states in 2005 had a better educated working-age population or civilian labor force than Massachusetts, and the age structure of our state's population was not less favorable than theirs to maintaining a high rate of labor force participation. These five states, on average, had somewhat smaller minority populations (especially Blacks and Hispanics) and fewer immigrants than Massachusetts.[1] In Massachusetts during recent years, Blacks, Asians, and female immigrants have tended to have lower participation rates than Whites and native born females (See Chart 14), but these race-ethnic differences in the population of the five states and Massachusetts cannot explain more than a tiny fraction of the participation rate gaps between their states and ours.[2] These five states simply are more successful in incorporating both men and women, younger, middle-aged, and older workers, and adults in all educational subgroups into their labor force and employing them (See Tables 31 and 32).

To illustrate the potential impacts on the size of the state's resident labor force from making our state a national leader in the labor force attachment of its working-age population, we conduct-

ed the following simple simulation exercise. We calculated how big the size of the state's resident labor force would have been in 2005 if the overall labor force participation rate of Massachusetts had increased to the 73.0% average of the top five performing states (Table 33). Each one percentage point rise in the state's civilian labor force participation rate would have increased the size of the resident labor force by slightly more than 50,000 persons in calendar year 2005. The average civilian labor force participation rate in these top five states in 2005 was 73.0%, which was 6.1 percentage points above that for our state. An increase of 6.1 percentage points in the state's labor force participation rate in 2005 would have increased the state's labor force to 3.669 million an increase of 305,000 (Table 33). This is more labor force growth than the state has seen in the past 20 years. Clearly, there is considerable room to boost the size of the resident labor force of the state by strengthening the labor force attachment of its existing working-age residents. This holds true for both men and women, for younger and older persons, for Blacks, Hispanics, and Whites, and for low income adults and the disabled. Following sections of this monograph will identify key demographic subgroups in Massachusetts whose participation rates can be and should be increased in the near future.

Declining Male Labor Force Attachment in Massachusetts: Its Adverse Impacts on State Labor Force Growth

The decline in the aggregate participation rate of Massachusetts residents over the past 15 years has been completely due to the behavior of males. The rate of labor force attachment among males in Massachusetts has been on the decline since the late 1980s. Findings of the decennial censuses for the past 30 years reveal a drop in the male

Table 31:

2005 Civilian Labor Force Participations Rates of Working-Age Persons in Massachusetts and the Top Five States with the Highest Overall Participation Rates by Gender and Age Group (in percent)

GROUP	MASSACHUSETTS	TOP FIVE STATES	TOP FIVE STATES – MASSACHUSETTS
All	66.9	73.0	+6.1
Men	72.8	78.5	+5.7
Women	61.5	67.6	+6.1
16-19	40.9	50.6	+9.7
20-24	64.0	75.5	+11.5
25-29	80.5	83.9	+3.4
30-34	74.8	84.6	+9.8
35-44	79.8	85.6	+5.8
45-54	80.9	85.3	+4.4
55-64	64.2	70.0	+5.8
65+	16.6	19.7	+3.1

Source: 2005 Monthly CPS public use files, tabulations by authors.

Table 32:

2005 Civilian Labor Force Participation Rates of Working-Age Persons in Massachusetts and the Top Five States by Educational Attainment

EDUCATIONAL ATTAINMENT	MASSACHUSETTS	TOP FIVE STATES	TOP FIVE STATES – MASSACHUSETTS
<12	36.9	41.8	+4.9
12 (GED or diploma)	59.8	66.8	+7.0
13-15 years	66.4	75.4	+9.0
BA degree	74.6	82.4	+7.8
MA or higher degree	80.0	81.2	+1.2

Table 33:

Simulating the Increase in the Massachusetts Resident Civilian Labor Force in 2005 if the State's Labor Force Participation Rate Matched that of the Top Five States in the Nation

VARIABLE	VALUE
Actual Civilian Labor Force in 2005 (LAUS Estimate)	3,364,500
Working-Age Population (16+)	5,026,800
Actual Civilian Labor Force Participation Rate in 2005 (CPS Estimate)	66.9%
Average Civilian Labor Force Participation Rate of Top Five States in 2005	73.0%
Massachusetts Civilian Labor Force Under a 73% Participation Rate	3,669,600
Simulated Increase in Massachusetts Resident Labor Force in 2005 if State Matched the Average Participation Rate of the Top Five States	+305,100

Table 34:

Trends in the Labor Force Participation Rates of Men (16+) and Women (16+) in Massachusetts, 1970 to 2000 (in percent)

YEAR	MEN	WOMEN
1970	78.0	45.0
1980	76.1	52.9
1990	76.2	60.3
2000	72.6	60.4
Percentage Point Change 1970-2000	-5.4	+15.4

Sources: 1970, 1980, 1990, and 2000 Censuses of Population and Housing.

Table 35:

Growth in the Massachusetts Civilian Labor Force 1960-2000 and the Male Share of that Growth by Decade

DECADE	CIVILIAN LABOR FORCE	GROWTH IN MALE CIVILIAN LABOR FORCE	GROWTH IN MALE SHARE OF GROWTH
1960-1970	301,845	89,621	30
1970-1980	426,955	132,684	31
1980-1990	429,576	157,780	37
1990-2000	66,050	2,040	3

Source: U.S. Census Bureau, Censuses of Population and Housing, 1960 to 2000, tabulations by authors.

labor force participation rate of about two percentage points between 1970 and 1980 followed by stability in the male participation rate during the economic boom decade of the 1980s (Table 34). Another steep decline of 3.6 percentage points in the male labor force participation rate took place between 1990 and 2000 despite very strong payroll job growth in the state from 1994 to 2000 and record low unemployment by the end of the decade. During the decade of the 1990s, the civilian labor force participation rates of Massachusetts males declined in all age groups except those 65 and older (Table 34). The size of these reductions in labor force participation rates were in the 2.2 to 4.2 percentage point range for Massachusetts males, with the steepest drop taking place among prime-age males 25-54 years of age (Table 37). In contrast to the behavior of men, Massachusetts women strongly increased their attachment to the labor force between 1970 and 1990, with their participation rate rising from 45.0% in 1970 to 60.3% in 1990. Their rate of participation stabilized in the 1990s, rising by only 0.1 percentage point over the decade, a statistically insignificant change.

The sharp decline in the male labor force participation rate in the 1990s nearly completely offset the modest rise in their population, leaving the size of the resident male labor force nearly unchanged over the decade. The male civilian labor force in the state rose by only 2,000, accounting for only 3% of the entire growth of 66,000 in the state's resident labor force over the decade (Table 35). Males also contributed a very low share of the New England region's labor force growth over the decade (10%), well below the 44% share of national labor force growth accounted for by men over the same decade.[3] The three percent share of state labor force growth in the 1990s accounted for by men was only one-tenth to one-twelfth as high as that of their contribution in the three prior decades (Table 36). The absence of any substantive growth in the male resident labor force over the 1990s was a key factor underlying the state's weak labor force growth during that decade.

A more disaggregated analysis of the nativity status of the state's labor force in 1990 and 2000 reveals an even more disturbing set of findings on the male labor force. Between 1990 and 2000, all of the net increase in the state's resident labor force was attributable to new foreign immigrants; i.e., those arriving in the U.S. between 1990 and the time of the 2000 Census. In early 2000, there were nearly 184,000 new foreign immigrants participating in the Massachusetts labor force. Since

the state's entire resident labor force increased by only 66,000 over the decade, the number of native born and established immigrant workers declined by nearly 118,000 over the decade.[4] The overwhelming share of the reduction in the number of native born labor force participants in the state took place among men. Between 1990 and 2000, the number of male, native born labor force participants (and established immigrants) fell by 100,000 while the number of new immigrant, male workers increased by 102,000 (Chart 15). In a number of substate areas, native born males, especially those with limited schooling, withdrew from active labor force participation while new immigrant workers increased in substantial numbers. More research is needed on the potential displacement of native born workers by nearly arrived immigrants. For the nation as a whole, recent evidence for the 2000-2005 period reveals that young adults (under 25, especially males with no post-secondary schooling) faced dwindling employment rates as the number of new immigrants in the state labor force increased.[5]

Long-term declines in male civilian labor force participation rates in Massachusetts also have been recorded by the CPS household survey over the past 27 years, 1978-2005 (Table 38). In the late 1970s, close to 80 percent of all working-age males in Massachusetts were active participants in the state's civilian labor force. By the end of the 1980s, the participation rate of males had declined modestly to 78%. By 2000, however, the participation rate of males in Massachusetts had fallen below 74 percent, and it would decline by another percentage point by 2005. Between 1978 and 2005, the civilian labor force participation rate of males in Massachusetts had fallen by nearly seven full percentage points. Declining rates of labor force attachment were the norm for males across the entire country.

Table 36:

The Growth of the Male and Female Civilian Labor Force in the U.S., New England, and Massachusetts, 1990-2000

GEOGRAPHIC AREA	GROWTH OF TOTAL CIVILIAN LABOR FORCE	GROWTH OF MALE CIVILIAN LABOR FORCE	GROWTH OF FEMALE CIVILIAN LABOR FORCE	MALE SHARE OF GROWTH
U.S.	14,195	6,299	7,896	44%
New England	179	17	162	10%
Massachusetts	66	2	64	3%

Source: 1990 and 2000 Census of Population and Housing, tabulations by authors.

Table 37:

Trends in the Civilian Labor Force Participation Rates of Males in Massachusetts within Selected Age Groups, 1990 to 2000 (in percent)

AGE GROUP	1990	2000	PERCENTAGE POINT CHANGE, 1990-2000
16-19	54.6	52.0	-2.6
20-24	77.9	75.5	-2.4
25-54	91.7	87.5	-4.2
55-64	73.5	71.3	-2.2
65-69	32.8	33.5	0.7
70 and older	13.3	13.8	0.5

Source: 1990 and 2000 Censuses of Population and Housing, tabulations by authors.

Chart 15:

The Growth of the Massachusetts Resident Labor Force by Nativity Status and Gender, 1990-2000

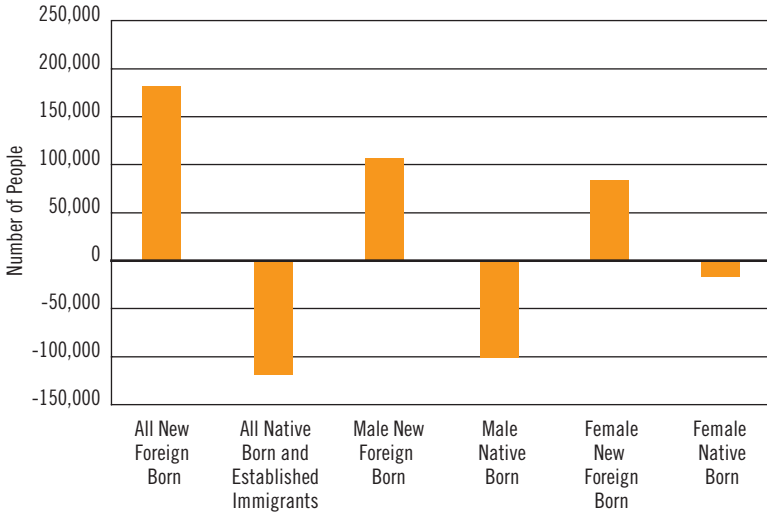
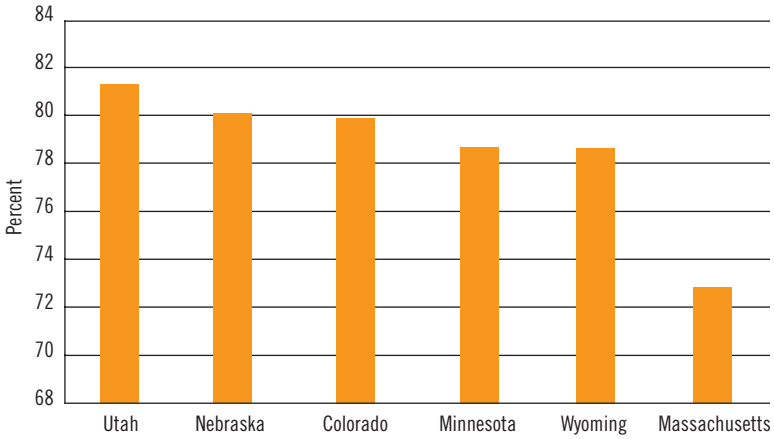


Chart 16:

The 2005 Civilian Labor Force Participation Rates of Men in the Five States with the Highest Participation Rates and Massachusetts (Annual Averages)



Over the same 27 year period, the participation rate of working-age males across the country fell by nearly 5 percentage points (Table 38). Massachusetts males' comparative ranking across the 50 states has deteriorated since the late 1980s. At the end of the state labor market boom in 1988, the male labor force participation rate in Massachusetts was nearly two percentage points above that of their male counterparts across the country (78% vs. 76%), and the state ranked 18th highest among the 50 states on this labor force activity measure. By 2005, however, the male labor force participation rate in Massachusetts was 0.5 percentage points below that of the nation (a statistical tie),[6] and the state ranked only 32nd highest among the 50 states. During 2005, the male labor force participation rate in our state (72.8%) was far behind those of the nation's top five performers including three Rocky Mountain states (Colorado, Utah, Wyoming) and two Midwestern states (Chart 16). The annual average participation rates of men in these five states ranged from 78.6% to 81.4% with an unweighted mean participation rate of 79.7%. This mean participation rate was nearly seven percentage points above that of working-age males in Massachusetts during 2005. If Massachusetts men had matched the labor force participation rate of males in these five states, there would have been approximately another 170,000 males active in the state's civilian labor force during 2005.

Table 38:

Trends in the Civilian Labor Force Participation Rates of Men (16+) in Massachusetts and the U.S., Selected Years, 1978 to 2005 (Annual Averages, in percent)

YEAR	MASSACHUSETTS	U.S.	MASSACHUSETTS – U.S.	MASSACHUSETTS RANK AMONG 50 STATES
1978	79.5	77.9	+1.6	20th (tie)
1979	79.3	77.8	+1.5	20th (tie)
1988	78.1	76.2	+1.9	18th
1989	77.7	76.4	+1.3	22nd
1995	75.0	75.0	0	29th
2000	73.8	74.8	-1.0	35th
2004	73.7	73.3	+0.4	24th (tied)
2005	72.8	73.3	-0.5	32nd
Percentage Point Change, 1978-2005	-6.7	-4.6	-2.1	—

Sources: (i) U.S. Bureau of Labor Statistics, Geographic Profiles of Employment and Unemployment, selected years, 1978 to 2004; (ii) Monthly CPS public use files, 2005, tabulations by authors.

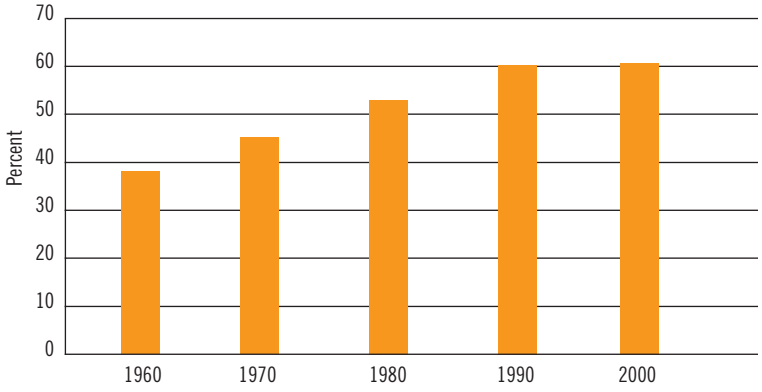
Trends in the Labor Force Participation Behavior of Women in Massachusetts

During most of the post-World War II era, the labor force participation rates of Massachusetts women increased steadily and strongly. From 1960 to 1990, the participation rate of working age women rose from 38.2% to 60.3%.[7] (Chart 17). A variety of demographic, human capital, and economic developments helped boost the labor force attachment of women over this time period. First, women increased their educational attainment, and higher levels of schooling among women are associated with increased attachment to the labor market. For example, in 2003-2004, the labor force participation rates of 20-64 year old Massachusetts women ranged from a low of 54% for those lacking a high school diploma/GED to a high of 83% for those with a Master's or higher degree. Second, women began to receive higher returns to work experience and schooling, thereby boosting their market wages. These higher market wages induced more women to join the labor force and to supply more hours of labor during the year.[8] Third, the industrial structure of employment in the state continued to shift away from goods producing industries (especially manufacturing, mining) toward service-related industries (trade, finance, private services), which are more intensive employers of women. In a number of trade and service industries (health care), women constitute a clear majority of the workers. At the time of the 2000 Census, nearly 78 percent of all workers in the state's health care and social service industries were women.

Based on the findings of the decennial Censuses, the labor force attachment of women in our state appears to have peaked in 1990. At the time of the 2000 Census, the overall participation rate for women was estimated to be 60.4%, statistically identical to the rate prevailing in

Chart 17:

Trends in the Labor Force Participation Rates of Working-Age Women in Massachusetts, 1960 to 2000 (in percent)



1990. Findings from the annual CPS household surveys over the past three decades reveal quite similar findings (Table 39). The annual average civilian labor force participation rate of women in 1978 was slightly over 53%. By 1989, the participation rate of Massachusetts women had risen to 61% and remained in that range for most of the 1990s, averaging 61.4% in 2000,

KEEPING OLDER WOMEN ACTIVELY ENGAGED IN THE LABOR FORCE WILL BE CRITICAL

the peak year of the 1990s economic boom.[9] The participation rate of U.S. women continued to rise throughout the 1990s decade, narrowing the gap between the participation rates of Massachusetts and U.S. women. In 2005, the civilian labor force participation rate of Massachusetts women was estimated at 61.5%, unchanged from its 2000 value. Thus, the overall participation rate of Massachusetts women has been essentially stagnant since the late 1980s while that of men has declined.

Massachusetts women were somewhat more

Table 39:

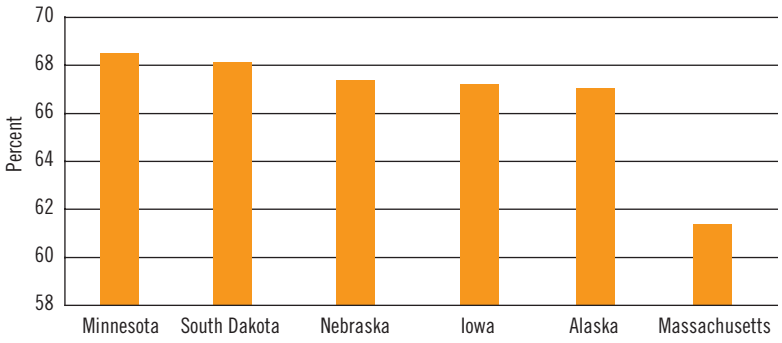
Trends in the Civilian Labor Force Participation Rates of Women (16+) in Massachusetts and the U.S., Selected Years, 1978 to 2005 (Annual Averages, in percent)

YEAR	MA	U.S.	MA – U.S.	MASSACHUSETTS RANK AMONG 50 STATES
1978	53.1	50.0	+3.1	15th
1979	54.5	50.9	+3.6	14th
1988	60.0	56.6	+3.4	19th
1989	61.0	57.4	+3.6	15th
1995	60.8	58.9	+1.9	22nd
2000	61.4	59.9	+1.5	30th
2004	61.9	59.2	+2.7	16th (ties)
2005	61.5	59.3	+2.2	26th
Change 1978-2005	+8.4	+9.3	-0.9	

Sources: U.S. Bureau of Labor Statistics, Geographic Profiles of Employment and Unemployment, selected years, 1978-2005.

Chart 18:

Civilian Labor Force Participation Rates of Women (16+) in Massachusetts and the Top Five States in the U.S., 2005 (Annual Averages)



strongly attached to the labor force than their national counterparts over the past 27 years, but the percentage point sizes of the differences in participation rates between the two groups of women have narrowed somewhat over time. In both 1979 and 1989, the annual average participation rate of Massachusetts women exceeded that of their U.S. counterparts by 3.6 percentage points. By 2000, the size of the gap had narrowed to 1.5 percentage points, but rose slightly to 2.2 percentage points in 2005 as the labor force participation rate of U.S. women declined modestly between 2000 and 2005 (Table 39).

Massachusetts' ranking among the 50 states with respect to the participation rate of women has deteriorated over time. In 1960, the state ranked 6th highest on this measure and ranked 8th highest at the time of the 1970 Census. By the late 1970s, Massachusetts women no longer ranked in the top ten states. The state ranked only 14th to 15th highest in the late 1970s and retained that rank in 1989. By 2000, however, the state's ranking had declined to 30th place and would improve only modestly to 26th place by 2005. The 61.5% participation rate of Massachusetts women in 2005 fell well below those of the top five states in the country (Chart 18). In these four Midwest states and Alaska, the participation rates of women ranged from 67.2% to 68.4% with an average of 67.7%, more than six percentage points above the Massachusetts rate. Given the 2.64 million working-age women residing in the state in 2005, each one percentage point rise in the state's civilian labor force participation rate for women would have increased the female labor force by 26,400. If Massachusetts had achieved a participation rate for women equal to the average of the top five states in 2005, there would have been an additional 163,000 women in the labor force. This finding clearly indicates that there is considerable room for boosting the civilian labor force attachment of women in our state, but the challenge will become more formidable as the state's working-age population continues to age at an accelerating rate over the coming decade. Keeping older women actively engaged in the labor market will be critical to achieving labor force growth in our state over the coming decade.

The Age Structure of Labor Force Participation Rates in Massachusetts in 2005

The labor force participation rates of the nation's working-age population tend to vary considerably by age group. Participation rates tend to rise steadily and considerably as youth move from their teen years through their 20s and early 30s and peak in their early to mid-40s (Chart 19). Participation rates then tend to fall sharply as older adults move from their mid-50s to their mid-60s and then again after age 65. In the U.S. during 2005, the annual average civilian labor force participation rates of working-age adults rose from approximately 44% for teenagers (16-19) to 75% for young adults (20-24), and peaked at 84% for those in the 35-44 age group. Among 55-64 year olds, the participation rate dipped to 63%, but then plummeted to 15% for those 65 and older. While participation rates of the older population (55 and older) had been declining for several decades, especially among men, they reversed direction in the mid-1990s and have been rising since then.[10] The civilian labor force participation rates of the older population are projected by the U.S. Bureau of Labor Statistics to continue to rise over the coming decade, with gains projected for men and women and nearly every major age subgroup of older workers.[11]

The labor force participation rates of Massachusetts adults by age group in 2005 tended to adhere closely but not perfectly to the national pattern (Table 40). The participation rates rose sharply from 47% among teens to 86% among 25-29 year olds and stayed close to the mid-80s for workers 35-54 years of age before declining sharply after age 55 and then more steeply after age 65. We ranked the participation rate for each age group in Massachusetts against their counterparts in each of the other 49 states and compared Massachusetts' participation rates with the

Chart 19:

The Annual Average Civilian Labor Force Participation Rates of the Working-Age Population in the U.S. by Age Group, 2005

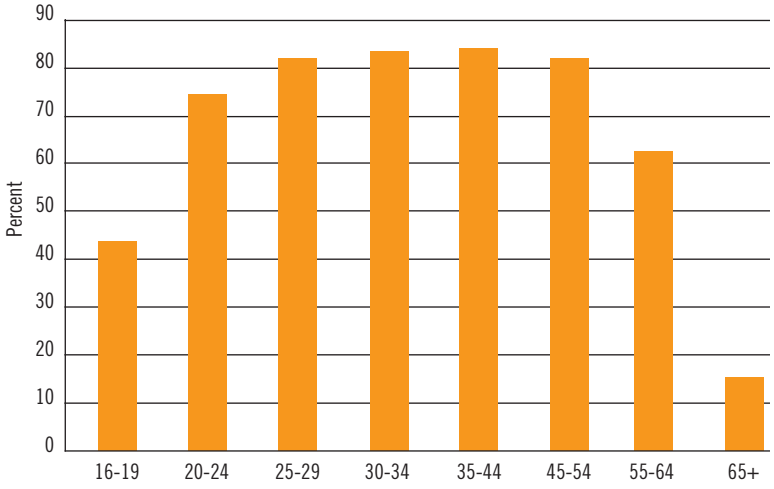


Table 40:

Labor Force Participation Rates of Working-Age Residents (16+) by Age Group in Massachusetts and the Average of the Top Five States in 2005

AGE	MA	MA RANK AMONG 50 STATES	TOP FIVE STATES	MA – TOP FIVE STATES
16-19	47.1	25th	61.7	-14.6
20-24	70.4	46th	83.3	-12.9
25-29	86.1	12th	89.5	-3.4
30-34	78.1	50th	89.9	-11.8
35-44	83.2	38th	89.9	-6.7
45-54	83.9	20th	88.6	-4.7
55-64	66.6	19th	74.5	-7.9
65+	17.1	17th	22.5	-4.4

Table 41:

Estimates of Additional Participants in 2005 if Mass. Had Matched the Average Performance of the Top Five States in Each Age Group

AGE GROUP	ADDITIONAL LABOR FORCE PARTICIPANTS
16-19	38,836
20-24	39,603
25-34	44,232
35-44	43,014
45-54	32,195
55-64	36,571
65+	23,716
Total	258,167

Note: Population estimates in 2004 were used to represent 2005.

Table 42:

Trends in the Civilian Labor Force Participation Rates of Teens 16-19 in Massachusetts and the U.S., Selected Years, 1978 to 2005 (Annual Averages, in percent)

YEAR	MA	U.S.	MA –U.S.	MA RANK AMONG 50 STATES
1978	65.1	57.8	+7.3	10th
1979	64.3	57.9	+6.4	13th (tie)
1980	62.1	56.7	+5.4	15th (tie)
1988	61.4	55.3	+6.1	10th (tie)
1989	59.6	55.9	+3.7	22nd
1995	56.7	53.5	+3.2	23rd
2000	52.0	52.0	0	27th
2004	47.2	43.9	+3.3	25th (tie)
2005	47.1	43.7	+3.4	25th
Change 1978-2005	-18.0	-14.1	-3.9	

Sources: U.S. Bureau of Labor Statistics, Geographic Profiles of Employment and Unemployment, selected years, 1978 – 2005.

average of the top five states in each age group.[12] In not one of these age groups did Massachusetts make the top ten states. Our highest ranking was 12th place for 25-29 year olds, and four age groups made the top 20 list. However, three age groups (20-24, 30-34, and 35-44 year olds) ranked near the bottom with large percentage point gaps between their participation rates and those of the top five performing states in 2005. For example, the gaps between the civilian labor force participation rates of teens, 20-24 year olds, and 30-34 year olds in Massachusetts were 12 to 15 percentage points below those of the top five performing states. If Massachusetts had matched the average participation rates of the top five performing states in each of seven age groups, we would have had another 258,000 individuals actively participating in the civilian labor force during that year. The potential to recruit additional workers from the ranks of existing residents in most age groups is quite considerable.

THE POTENTIAL TO RECRUIT ADDITIONAL WORKERS FROM EXISTING RESIDENTS IS CONSIDERABLE

Trends in the Labor Force Behavior of Teens in Massachusetts

Nationally, the labor market for teens weakened considerably after the end of the labor market boom in 2000, with steep drops in their labor force participation rates and employment rates through 2003 and little to no recovery in the first two years of renewed job growth from the fall of 2003 through 2005.[13] Between 2000 and 2004, the annual average teen employment rate for the nation fell from 45.2% to 36.4%, a decline of nearly 9 percentage points, and the employment/population ratio of teens remained there in 2005 despite renewed job growth across the country.[14] The national teen E/P ratios in 2004 and 2005 were tied for the lowest in U.S. post-World War II history and were 12 percentage points below the teen E/P ratios prevailing in 1979 and 1989 at the near peak of the business cycles in these two decades.

How have Massachusetts teens fared in the labor market over the past few decades and since the end of the state's labor market boom in 2000? Findings of our analysis of state CPS data on teen labor force participation rates over the 1978-2005 period are displayed in Table 42. In the late 1970s, close to two-thirds of the state's teenagers were active participants in the state's civilian labor force. Participation rates of teens fell in the recessionary labor market environment of the early 1980s and hovered around 60 percent in the late 1980s. In the 1990s, the participation rates of teens fell further and were equal to an average of only 55% in 1999-2000. The partici-

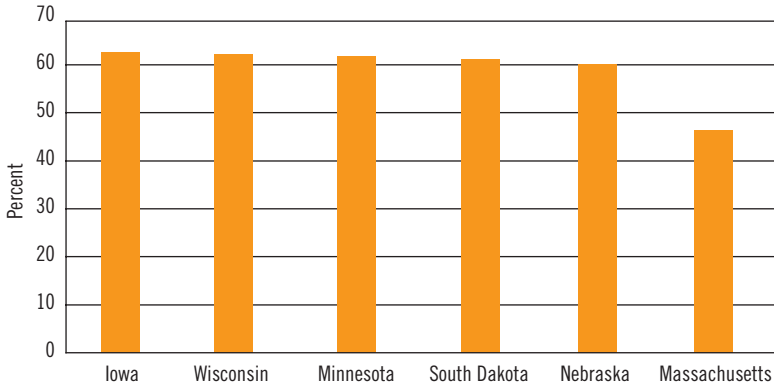
pation rate of the state's teens has declined even more considerably over the past five years, falling to 47% in 2005, an eighteen percentage point drop from its values in 1978 (Table 42). The employment/population ratio of the state's teens was only 41% in 2005, nearly 20 percentage points below its rate in the late 1970s.

Massachusetts teens continue to participate in the civilian labor force at rates above those of their national counterparts, but the size of the participation rate gaps between state and U.S. teens has declined over time. As late as 1988, there was a six percentage point gap in favor of Massachusetts teens but the advantage has fallen to only three percentage points in the past two years (2004-2005). Massachusetts' teen participation rate ranked 10th highest among the 50 states as recently as 1988, but the state's ranking has declined considerably since then, ranking only 25th highest in the past two years, right in the middle of the state distribution.

Massachusetts teens fell well below the top five state performers in 2005. The top five states with the highest teen participation rates in 2005 were all located in the Midwest region, and their participation rates ranged from 60% in Nebraska to just under 63% in Iowa. In comparison, the Massachusetts teen participation rate in 2005 was only 47%, which was 14.6 percentage points below the average of the top five performing states in the nation. Each one percentage point rise in the state teen participation rate in 2005 would have brought an additional 2,700 teens into the state's resident labor force. If Massachusetts had matched the average 61.7% teen participation rate in the top five states, there would have been an additional 39,000 teens active in the state's labor force in 2005. As will be noted below, many of the teens brought into the labor force would have been from low to moderate income families, race-ethnic minority groups, especially Blacks and Hispanics, and high school dropouts, all of whom should be targets of state workforce development policy.

Chart 20:

Civilian Labor Force Participation Rates of Teens 16-19 in Massachusetts and the Top Five States in the U.S., 2005 (Annual Averages)



The Employment/Population Ratios of Massachusetts High School Students and Young High School Dropouts During 2003 and 2004

The previous section described the downward trend in the labor force participation rates of teens in Massachusetts in recent years and over the past few decades. Given this finding, one might ask what subgroups of teens have encountered the most difficulty in securing a job in Massachusetts? To answer this question, three groups of teens will be analyzed. They are high school students, high school dropouts, and high school graduates who were not enrolled in college during 2003 and 2004. Within each of these three groups, the employment experiences of gender, race-ethnic, and socioeconomic subgroups of teens will be compared at times.

The ability of Massachusetts' teenaged high school students to gain some employment experience during the past four years has declined

quite sharply, especially among men.[15] In Chart 1, we compare the employment rates of 16-19 year old high school students in 2000 at the time of the Census with their corresponding employment rates in calendar year 2004. The 2000 findings are based on the long form questionnaires used in conducting the 2000 Census while the 2004 results are based on the 12 months of interviews undertaken by the U.S. Census Bureau as part of the 2004 American Community Surveys.[16] At the time of the 2000 Census (the March-April period of that year), slightly under 40 percent of all 16-19 year old students across the state were employed. By 2004, however, the employment rate among these students had declined to 32%, a drop of nearly 8 percentage points, considerably greater than that for any other age group in the state over the same four year period (Chart 21). The drop in the employment rate of male high school students across the state was considerably greater than that for female students over this four year period. The male teen employment rate fell by more than ten percentage points from 38 to 28 percent while that of female high school students fell by only a little more than four percentage points over the same time period. In 2004, female high school students in our state were considerably more likely to be working than their male counterparts (37% vs. 28%). During 2003, female high school students enjoyed a six percentage point employment rate advantage over their male high school peers. Nationally, in 2004, the gender gap in employment rates between female and male high school students was only two percentage points.

Chart 21:

Employment/Population Ratios of 16-19 Year-Old High School Students In Massachusetts, All and by Gender in 2000 and 2004 (in %)

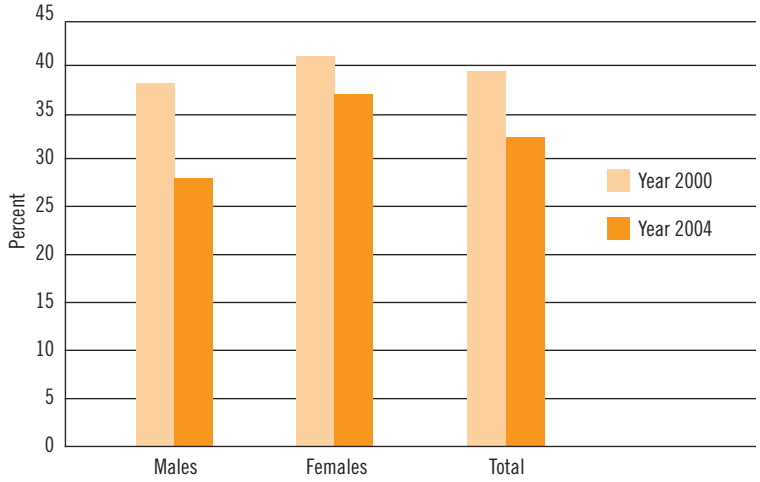
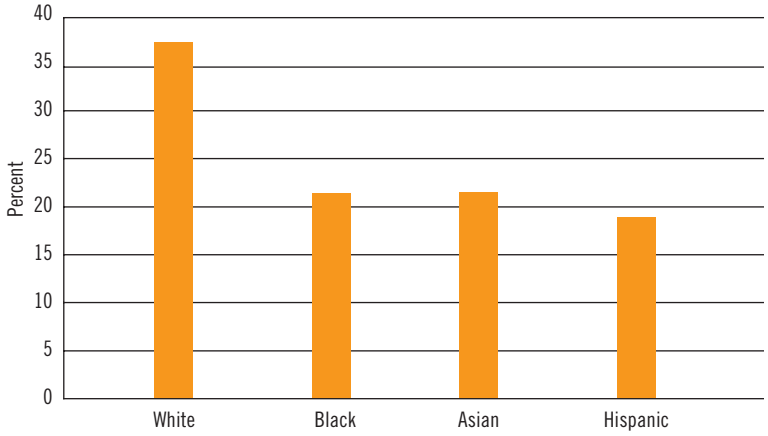


Chart 22:

Employment/Population Ratios of High School Students in Massachusetts by Gender and Race-Ethnic Group, (2-year Annual Averages, 2003-2004)



Similar to national findings, during 2003 and 2004, employment rates of high school students in Massachusetts varied substantially by race-ethnic group. Chart 22 displays estimates of the employment/population ratios of teenaged high school students by race-ethnic group using a simple two-year average from the 2003 and 2004 ACS surveys. White, non-Hispanic high school students were much more likely to be working during 2003 and 2004 than were their Black, Hispanic and Asian counterparts. The employment rates of students in each of these groups ranged from a low of 19 percent for Hispanics, to

21 percent for Black and Asian teens, and to a high of nearly 38% for White, non-Hispanic students.[17] White students were, thus, twice as likely to be working as their Asian, Black, and Hispanic peers.

Employment rates of high school students in Massachusetts also varied considerably across family income groups. High school students from more affluent families had substantially higher employment rates than their peers from lower family income groups. In Chart 23, the employment rates of high school students are compared across income groups classified by the size of their family income relative to the poverty line. Students living in families with incomes two or more times the poverty income threshold were twice as likely to report holding a job than students with incomes below two times the poverty income threshold. Only 18 percent of high school students from poor families were employed versus 38 percent of their counterparts in families with incomes three or more times the poverty line.

In this substantially changed labor market environment in the state, how have young high school dropouts fared in terms of their ability to obtain some type of employment?[18] During 2004, the E/P ratio for 16-19 year old dropouts in Massachusetts was only 31.4%, eight percentage points below the U.S. average (Chart 24). Fewer than one-third of young dropouts had any type of job. Massachusetts ranked sixth lowest among the 50 states on this core employment measure.[19] The states with the five highest E/P ratios for dropouts, including New Hampshire, are also displayed in Chart 24. The employment rates for young dropouts in these five states ranged from 55.6 to 65.4 percent, exceeding the Massachusetts employment rate by 24 to 34 percentage points. The findings for 2004 were not a statistical aberration. Similar findings for calendar year 2003 revealed an E/P ratio for young high school dropouts in Massachusetts of only 28%, twelve points below the national average. The state again ranked sixth lowest among the 50 states on this employment measure.

Employment rates of young high school dropouts in Massachusetts during 2004 also were calculated for selected family income subgroups

Chart 23:

Employment/Population Ratios of 16-19 Year Old High School Students in Massachusetts by the Size of Their Family Income Relative to the Poverty Line (2003 and 2004 Two Year Averages)

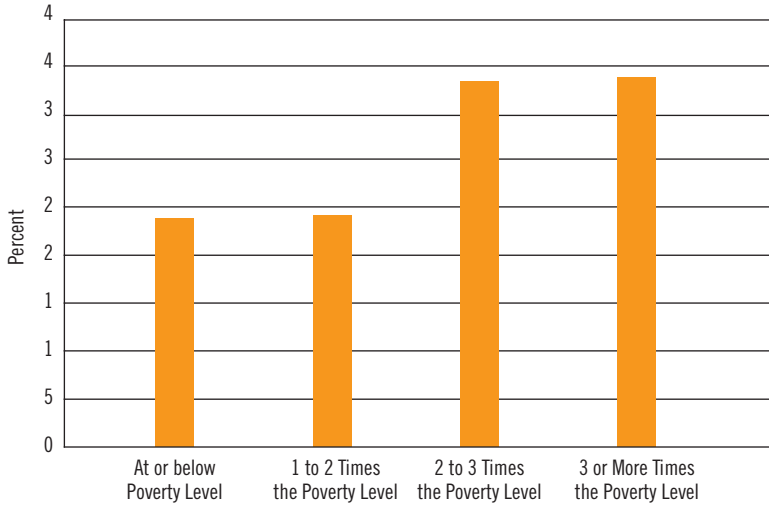
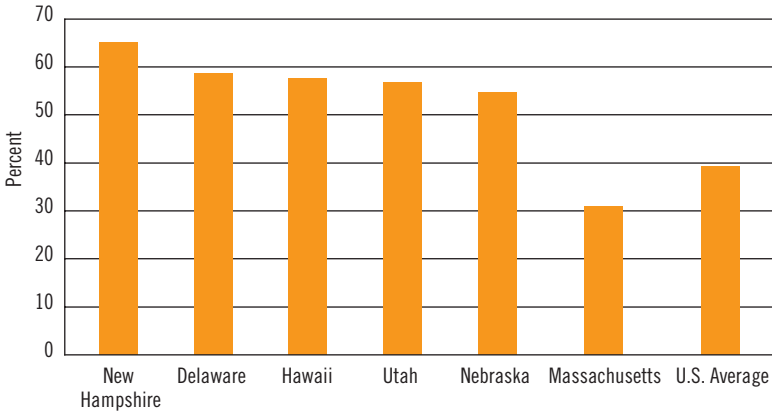


Chart 24:

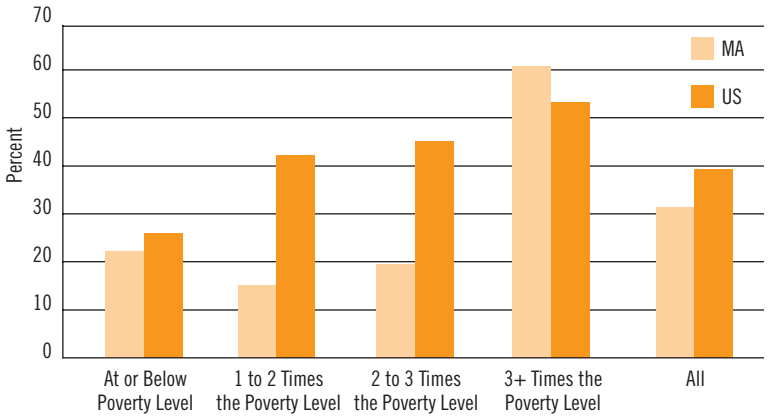
Employment/Population Ratios of 16-19 Year-Old High School Dropouts in the U.S., Massachusetts, and the Five Highest Employment States in 2004



and were compared to those for the U.S. (Chart 25). Dropouts living in poor families faced the bleakest employment prospects. Only one of every five dropouts living in families with incomes below three times the poverty line were employed in 2004. The employment rate of dropouts in middle income families was three times higher at 61% (Chart 25). Poor, low income, and lower middle income dropouts in Massachusetts were employed at rates well below those of their national peers in 2004. For example, only 16% of high school dropouts from families with incomes between one and two times the poverty line were employed in Massachusetts in 2004 versus 42% of their U.S. peers. In 2003 and 2004, young dropouts from poor families in our state were employed at rates well below those of their peers across the nation. In 2003, only 15% reported any type of job versus 22% in 2004. The labor market fortunes of young high school dropouts in Massachusetts are quite bleak, and their long term economic prospects also are not very bright.[20] They face very limited long term earnings and income prospects.

Chart 25:

Employment/Population Ratios of 16-19 Year-Old High School Dropouts in Massachusetts and the U.S. by the Size of Their Family Income Relative to the Poverty Line in 2004



The Potential Employment Impacts of Boosting the Employment Rates of Massachusetts High School Students, High School Graduates, and High School Dropouts to Match Those of the Top Five States With the Highest Teen Employment Rates

Given the recent decline in the state's resident labor force and limited population growth, Massachusetts must raise the labor force participation rates of existing residents (16 years and older) to grow its labor force in the near future. One source of additional labor for the state' economy is its resident teen population. Boosting Massachusetts teen employment rates to match those of states with higher rates of teen employment would provide additional workers for the state's economy. Having more teens with substantive work experience will also boost the supply of young adults in the labor force in the future. If teens in Massachusetts worked at rates equal to the average of the 5 states with the highest teen employment rates in 2004, how many additional teens would have been employed in the state during 2004? To answer this question, we examined the employment rates of the same three educational attainment/ school enrollment groups of teens across the 50 states and D.C. The three groups are high school students, high school graduates who were not enrolled in college, and high school dropouts. For each group, the employment rates for males and females were analyzed separately. Estimates of the employment rates for these gender and educational attainment subgroups of teens were made for all of the states and D.C., and the states were ranked from highest to lowest in terms of their employment rates. The employment rates for Massachusetts' teens were compared to the average of the five states with the highest employment rates for each gender and educational attainment subgroup of teens.

In Table 43, the employment rates for Massachusetts high school students are compared to the employment rates of high school students in the five states with the highest employment rates for this group of teens. High school students in Massachusetts had an employment rate of 32.2% in 2004, ranking the 23rd highest among the 50 states and D.C. Although high school students in Massachusetts ranked in the middle of the pack in terms of holding a job, their employment rate was approximately 14 percentage points below that of high school students in the five states with the highest employment rates for high school students. Male high school students in Massachusetts faced an even larger gap of 18 percentage points compared to those of their counterparts in the top five states. If Massachusetts boosted the employment rates of high school students to match the employment rates of the top five states, then there would have been an additional 29,300 high school students employed during 2004.

A similar analysis at the time of the ACS surveys was conducted for those high school graduates who were not enrolled in college. The employment rate for non-enrolled high school graduates in Massachusetts only ranked 35th highest among the 50 states and D.C in 2004. The gap between the employment rate for high school graduates in Massachusetts and the average of the top five states was 20 percentage points. In contrast to high school students, the employment rate gap between the top five performing states and Massachusetts was wider for females than it was for males. If both male and female high school graduates were employed at rates equal to their counterparts in states with the five highest employment rates there, would have been approximately 5,400 additional teenaged high school graduates employed in Massachusetts during 2004.

Table 43:

The Difference Between the Employment Rates of High School Students in Massachusetts and the Average Employment Rates of High School Students in the Five States With the Highest Employment Rates for High School Students, by Gender, 2004

	MASSACHUSETTS	TOP 5 STATES	DIFFERENCE
All	32.2	46.5	-14.3
Men	27.9	45.9	-18.0
Women	37.2	50.4	-13.2

Table 44:

The Difference Between the Employment Rates of Non-Enrolled High School Graduates in Massachusetts and the Average Employment Rates of Non-Enrolled High School Graduates in the Five States With the Highest Employment Rates for Non-Enrolled High School Graduates, by Gender, 2004

	MASSACHUSETTS	TOP 5 STATES	DIFFERENCE
All	59.1	79.2	-20.1
Men	68.2	82.2	- 14.0
Women	50.6	83.1	- 32.5

Table 45:

The Difference Between the Employment Rates of High School Dropouts in Massachusetts and the Average Employment Rates of High School Dropouts in the Five States With the Highest Employment Rates for High School Dropouts, by Gender, 2004

	MASSACHUSETTS	TOP 5 STATES	DIFFERENCE
All	31.4	58.9	- 27.5
Men	30.9	70.8	- 39.9
Women	32.2	57.5	- 25.3

The third group of teens for whom the analysis was conducted was high school dropouts. Employment rates for high school dropouts in Massachusetts, especially male dropouts, are among

the lowest in the nation. Only 31% of high school dropouts 16 to 19 years of age were employed in Massachusetts during 2004, the seventh lowest employment rate for dropouts among the 50 states and D.C. This employment rate was nearly 28 percentage points below that of dropouts residing in states with the five highest employment rates for high school dropouts. The employment rate gap between male dropouts in Massachusetts and dropouts residing in the five highest employment states was 40 percentage points.

THE LONG-TERM ECONOMIC PROSPECTS OF YOUNG HIGH SCHOOL DROPOUTS ARE BLEAK

Boosting the employment rates of these three groups of Massachusetts teens (high school students, high school graduates not enrolled in college, and high school dropouts) to equal the average employment rate of the top five states would substantially increase the number of teens employed in the state. The hypothetical increase can be estimated by multiplying the employment rate gap (column C in Tables 43, 44, and 45) by the population in each educational attainment category. In Table 46, the estimates of the additional number of employed teens are displayed. Another 42,000 teens would have been employed during 2004 if Massachusetts were a leader in teen employment rates for the three groups studied. There would have been 30,000 additional high school students working, and nearly 5,500 high school graduates employed during 2004. Increasing the employment rate of high school dropouts in Massachusetts to match those of the top five states would have more than doubled the number of young dropouts employed in the state during 2004.

Many of the additionally employed teens in Massachusetts would come from low income and minority backgrounds. The employment rates of low income high school students and high school dropouts are considerably lower than their peers from more affluent family income backgrounds. To achieve the goal of matching the average employment rate of the top 5 states in each youth category, a substantial portion of the increase in employment would come from lower income teens and Black and Hispanic teens. The states with the highest employment rates have smaller employment gaps across socioeconomic and race-ethnic subgroups of teens. Achievement of this goal would also help narrow future labor market disparities across these groups as they age.

Table 46:

Hypothetical Increase in Teen Employment in Massachusetts If Each Group's Employment Rate Equaled the Average of the Five States With the Highest Employment Rates for That Educational Attainment and Gender Subgroup, 2004

GROUP	ADDITIONAL MALES EMPLOYED	ADDITIONAL FEMALES EMPLOYED	TOTAL ADDITIONAL EMPLOYED	TOTAL ACTUAL EMPLOYED
High School Students	18,022	11,281	29,304	59,799
High School Graduates, Not Enrolled in College	1,570	3,851	5,421	13,642
High School Dropouts	5,265	2,039	7,305	6,675
Total, Above 3 Groups	24,857	17,171	42,030	80,116

The Civilian Labor Force Participation Rates of Massachusetts Working-Age Adults by Educational Attainment, 1990-2005

Over the decade of the 1990's, the overall labor force participation rate of 16-64 year old state residents not enrolled in school declined, falling from 81.6% in 1990 to 79.8% in 2000, a decline of 1.8 percentage points (Table 47).[21] To better understand the sources of this decline in the participation rate, the 16-64 year old population was divided into five educational attainment subgroups, and the participation rates of each educational subgroup in 1990 and 2000 were calculated. The labor force participation rates of each educational attainment subgroup in Massachusetts declined between 1990 and 2000; however, the percentage point sizes of these declines varied across educational subgroups, ranging from nearly six percentage points among those persons lacking a high school diploma/GED to a low of 2 percentage points among those with a Bachelor's degree (Table 47). In relative terms, the sizes of these declines were even more widespread across these educational subgroups. Among high school dropouts, the reduction in the participation rate over the decade was equal to nearly 9 percent in relative terms versus only a little over 2 percent among those adults with a Bachelor's degree.

Over the 1990's, the decline in the participation rate of working-age adults in Massachusetts was concentrated entirely among men. A separate analysis of the participation rates of men and women by educational attainment was undertaken for both 1990 and 2000. Among 16-64 year old males, labor force participation rates declined in each educational attainment group, but the size of these declines varied quite considerably across the five educational groups. Male high school dropouts experienced a 10 percentage point drop in their participation rate versus a near 7 percentage point decline for male high school graduates and a less than 2 percentage point drop among those with a bachelor's or advanced degree. Declines in labor force participation among males without high school diplomas were quite severe among both younger males (under 30) and older males (45-64). The steep drop in the labor force participation rate of male high school graduates (6.7 percentage points) with no post-secondary schooling should also be viewed as troublesome. In 2000, state labor markets were very strong, with the state's annual average unemployment rate for the year being only 2.7%, the lowest in the past 32 years for which CPS unemployment data were available.[22] Steep declines in both labor force participation and employment rates for men without any post-secondary schooling during a time period of strong overall labor market conditions suggest growing structural adjustment problems among both younger and older males in the state. These problems seemed to be particularly severe in the state's large central cities (Boston, Lawrence, New Bedford, Springfield).

Among women, the overall participation rate

Table 47:

Trends in the Civilian Labor Force Participation Rates of 16-64 Year Olds in Massachusetts Not Enrolled in School by Educational Attainment, 1990-2000

EDUCATIONAL GROUP	1990	2000	PERCENTAGE POINT CHANGE
<12 or 12, no diploma	64.9	59.1	-5.8
H.S. diploma/GED	80.0	76.4	-3.6
13-15 years	85.5	82.5	-3.0
Bachelor's degree	89.3	87.1	-2.2
Master's or higher degree	92.9	90.1	-2.8
All	81.6	79.8	-1.8

Source: 1990 and 2000 Censuses of Population and Housing, public use files, tabulations by authors.

Table 48:

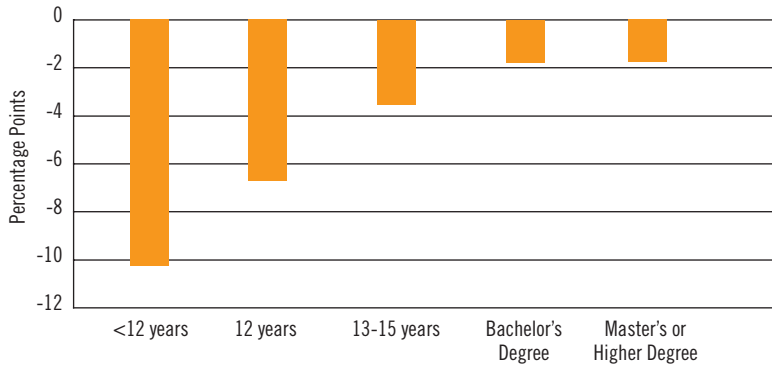
Trends in the Civilian Labor Force Participation Rates of 16-64 Year Olds in Massachusetts by Educational Attainment and by Gender, 1990-2000 (Excluding Students)

	MEN			WOMEN		
EDUCATIONAL GROUP	1990	2000	PERCENTAGE POINT CHANGE	1990	2000	PERCENTAGE POINT CHANGE
<12 or 12 no diploma	75.8	65.5	-10.3	53.5	51.9	-1.6
H.S. diploma / GED	89.6	82.9	-6.7	71.4	69.6	-1.8
13-15 years	91.9	88.2	-3.7	79.2	77.8	-1.4
Bachelor's degree	95.5	93.6	-1.9	83.3	81.1	-2.2
Master's or higher degree	96.2	94.4	-1.8	88.5	85.6	-2.9
All	89.5	85.5	-4.0	73.7	74.3	+0.6

rose modestly between 1990 and 2000; however, all of this modest rise of 0.6 percentage points was due to a better educated, female working-age population. Within each of the five educational subgroups, the participation rates of 16-64 year old women declined between 1990 and 2000, with the size of these declines varying only modestly across educational subgroups unlike the pattern among men. In 2000, however, the civilian labor force participation rates of the state's working-age women (16-64) varied quite widely across educational attainment subgroups, ranging from a low of 52 percent among women lacking a high school diploma to a high of nearly 86 percent among women with a Master's or higher degree.

Chart 26:

Percentage Point Changes in the Civilian Labor Force Participation Rates of 16-64 Year Old, Non-Enrolled Men in Massachusetts Between 1990 and 2000 by Educational Attainment



The annual average civilian labor force participation rates of working-age adults in Massachusetts during 2005 by their level of educational attainment at the time of the CPS surveys are displayed in Table 49. The participation rates of Massachusetts working-age adults in 2005 varied quite markedly by their level of formal schooling, ranging from a low of slightly under 42% among those lacking a high school diploma/GED to nearly 78% for those with a Bachelor's degree and to a high of 81% for those with a Master's or higher degree.[23] The much higher degree of labor force attachment among better educated adults is primarily attributable to their higher expect market wages from employment. Higher market wages raise both the opportunity cost of leisure and the shadow costs of producing output in the home and should lead to a substitution of market work for leisure and time devoted to home output, such as cooking, cleaning, and child care.[24]

The annual average 2005 labor force participation rates of Massachusetts adults in four of the five educational attainment subgroups ranked quite low in comparison to their counterparts in

the other 49 states. The only educational subgroup of adults to rank in the upper half of the state distribution of labor force participation rates was those with a Master's or higher academic degree. This group ranked 14th highest among the 50 states. Each of the other four educational subgroups ranked in the bottom half, with ranks ranging from 32nd (persons with a Bachelor's degree) to 44th, adults with 1-3 years of college. Again, Massachusetts was not a national leader among any educational subgroup and ranked quite low among all subgroups except those with a Master's degree.

We have conducted one additional labor force simulation exercise with the 2005 CPS labor force data. First, we estimated the 2005 annual average labor force participation rates of each of the above educational subgroups in each of the 50 states. With these states ranked in order from highest to lowest, we then identified the top five performers in each educational attainment category. Findings are presented in Table 50. The top five performers in each of these educational categories were typically states in the Midwest or Rocky Mountain regions. In only one case (Vermont) did the top five performers include a New England state, and the South and the Northeast regions seldom made the top five. As noted earlier, Massachusetts never made the top 10 for any subgroup, and only made the top 25 states for one of the five educational subgroups.

Second, we then calculated the simple, unweighted average participation rate for the top five states in each educational attainment subgroup. These participation rates are displayed in Column A of Table 51. These rates ranged from 54% for adults lacking a high school diploma/GED certificate to highs of 84 percent for those possessing a Bachelor's or higher academic degree. These average participation rates for the top five performers were then compared to those for Massachusetts adults in each of the five educational subgroups. The gaps between these two participation rates were quite large for four of the five educational subgroups, ranging from 6.7 to 12.7 percentage points. The smallest gap (3.0 percentage points) was for adults with a Master's or higher degree.

Third, we then estimated the additional number of civilian labor force participants in Massa-

Chart 27:

Percentage Point Changes in the Civilian Labor Force Participation Rates of 16-64 Year Old, Non-Enrolled-in-School Women in Massachusetts Between 1990 and 2000 by Educational Attainment

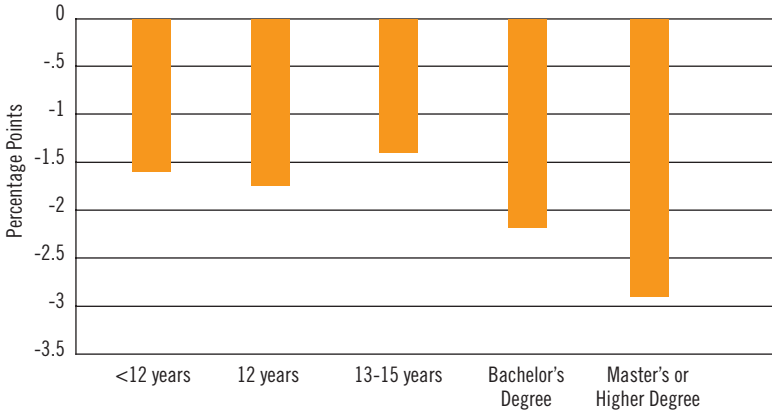


Table 49:

2005 Civilian Labor Force Participation Rates of Persons 16 and Older in Massachusetts by Their Educational Attainment and Their Ranking Among the 50 States (rates are in percent, Annual Averages)

EDUCATIONAL GROUP	PARTICIPATION RATE	STATE RANKING
<12 or 12, no diploma*	41.7	34th
H.S. graduate or GED, no college	63.6	39th
13-15 years, including Associate's degree	69.7	44th
Bachelor's degree	77.6	32nd
Master's or higher degree	81.3	14th (tie)

Source: 2005 monthly CPS public use files, tabulations by authors. Note: (*) High school students will be included in this educational category. College students will appear in the group that matches their highest year of schooling completed. Most will appear in the 13-15 years category.

Table 50:

A Listing of the Five States With the Highest Civilian Labor Force Participation Rates in 2005 by Educational Attainment Group (rates in percent)

12 OR 12 YEARS, NO DIPLOMA OR GED		HIGH SCHOOL DIPLOMA/GED		1-3 YEARS OF COLLEGE		BACHELOR'S DEGREE		MASTER'S OR HIGHER DEGREE	
Nevada	56.3	Vermont	71.4	S.D.	79.1	N.D.	87.1	Georgia	85.3
Utah	56.1	S.D.	71.4	Nebraska	78.5	S.D.	84.5	N.D.	85.3
Nebraska	54.7	Alaska	71.2	Minnesota	78.5	Nebraska	83.9	Wyoming	84.0
Colorado	53.5	N.D.	71.1	N.D.	78.1	Iowa	82.8	Iowa	83.7
Idaho	51.2	Colorado	70.8	Iowa	78.1	Minnesota	82.1	Alaska	83.4

Table 51:

Simulating the Impacts on the Massachusetts Labor Force of Increasing the Labor Force Participation Rates of Each Educational Subgroup to the Average of the Top Five Performers in 2005

EDUCATIONAL ATTAINMENT GROUP	AVERAGE PARTICIPATION RATE OF TOP FIVE PERFORMERS (IN %)	MASSACHUSETTS' PARTICIPATION RATE (IN %)	INCREASE IN MASSACHUSETTS' PARTICIPATION RATE (A-B, IN PERCENTAGE POINTS)	INCREASE IN NUMBER OF MASSACHUSETTS' CIVILIAN LABOR FORCE PARTICIPANTS IN GROUP
<12 or 12, no diploma	54.4	41.7	+12.7	97,102
H.S. diploma/GED	71.2	63.6	+7.6	109,330
13-15 years	78.5	69.7	+8.8	99,037
Bachelor's degree	84.3	77.6	+6.7	69,937
Master's or higher degree	84.3	81.3	+3.0	20,094
All				395,500

Source: Monthly 2005 CPS Surveys, public use files, tabulations by authors.

chusetts in each educational subgroup in 2005 if Massachusetts had matched the average labor force participation rate of the top five performers in each group. These estimates are displayed in Column D of Table 51. The simulated increase in the pool of Massachusetts labor force participants is very high in each educational subgroup, except for Master's degree holders. There would have been close to or more than 100,000 additional labor force participants in each of the three lower educational subgroups and 90,000 additional labor force participants with a Bachelor's or higher degree. The combined pool of additional labor force participants in the state in 2005 would have been just under 400,000 (Table 51).

A very high fraction (52%) of the simulated increase in the pool of labor force participants would have come from working-age adults with 12 or fewer years of schooling. Members of these two educational groups, especially males and inner city residents, have faced growing structural problems in Massachusetts labor markets since the end of the 1980s economic boom. They have been less strongly attached to the labor force, faced rising unemployment and underemployment problems since early 2001, experienced declines in their mean real annual earnings, faced a higher incidence of low income problems, and become increasingly dependent on SSI disability and SSDI disability payments to support

themselves and their families. Workforce development programs that are capable of boosting the labor force attachment and employability of members of these two educational subgroups could help achieve a number of desirable economic and social goals for the state in addition to an expanded resident labor force.

Strengthening the labor force attachment of the three groups of adults with at least some post-secondary schooling to match the performance of the top five states also would produce a sizable gain in the pool of well-educated labor force participants. There would have been 189,000 additional labor force participants in these three groups, including just under 100,000 persons with 1-3 years of post-secondary schooling.[25] These findings clearly suggest that a major expansion in the Massachusetts labor force could occur by substantially strengthening the labor force attachment of existing residents rather than by relying on in-migrants from other states or by becoming even more dependent on new foreign immigrants. Boosting the employability and earnings prospects of existing residents might also encourage more of them to remain in the state, thereby curtailing the high levels of domestic out-migration that occurred over the past three years and reduced the size of the state's resident labor force.

The Labor Force Participation Behavior of the Native and Foreign Born Populations of Massachusetts in 2005

During the past few decades, the state has been totally dependent on new immigrant inflows for generating growth in its resident population. Over time, a rising share of the state's working-age population has become foreign born. In 2005, slightly over 18% of the working-age population of Massachusetts was foreign born versus only 15% for the U.S. (Table 52). The share of the working-age population in Massachusetts that was foreign born in that year was 8th highest across the 50 states. The states are characterized by an extraordinarily high degree of variability in the relative size of their foreign born populations. In 2005, these foreign born shares ranged from highs of 25 to 33 percent in New Jersey, New York, and California to lows of 1 to 2 percent in North Dakota, Montana, and West Virginia (Table 53).

Given the growing importance of the foreign born population in our state, especially in the working-age group, it would seem desirable to analyze the labor force participation behaviors of the native and foreign born populations in our state and to compare these findings with those for the nation and the other 49 states. Our analysis of the 2005 CPS survey findings are displayed in Table 54. During that year, on average, nearly 67 percent of the state's native born population

Table 52:

The Native and Foreign Born Share of the Working-Age Population in Massachusetts and the U.S, 2005 (in percent)

GROUP	MA	U.S.	MA – U.S.	MASSACHUSETTS RANK AMONG 50 STATES
Native Born	81.9	85.0	-3.1	42nd highest
Foreign Born	18.1	15.0	+3.1	8th highest

Table 53:

The Five States with the Highest and Lowest Shares of Their Resident Populations that Were Foreign Born, 2005

FIVE HIGHEST		FIVE LOWEST	
California	33.4	Maine	2.9
New York	27.0	Wyoming	2.0
New Jersey	25.0	North Dakota	2.0
Florida	23.8	Montana	1.2
Hawaii	22.4	West Virginia	0.7

Table 54:

Comparisons of the Civilian Labor Force Participation Rates of the Native Born, Foreign Born, and New Immigrant Working-Age Populations of Massachusetts and the U.S. in 2005 (Annual Averages, in percent)

GROUP	MA	U.S.	MA – U.S.	MASSACHUSETTS RANK AMONG 50 STATES
All	66.9	66.3	+0.6	28th
Native Born	66.9	66.1	+0.8	27th
Foreign Born	67.0	67.5	-0.5	36th tie
New immigrants[1]	72.9	67.3	+5.6	11th tie

Source: 2005 monthly CPS surveys, public use files, tabulations by authors.
Note: (1) New immigrants are those who arrived in the U.S. between 2000 and 2005.

Table 55:

Listing of the Five States with the Highest Civilian Labor Force Participation Rates Among the Native Born and Foreign Born Working-Age Population in 2005 (numbers in percent)

STATE	NATIVE BORN	STATE	FOREIGN BORN
Minnesota	73.8	Mississippi	77.6
Nebraska	73.4	Indiana	76.3
South Dakota	72.8	Nebraska	75.9
Alaska	72.7	South Dakota	75.9
North Dakota	72.6	Virginia	75.5
Average of Top 5 States	73.1	Average of Top 5 States	76.3

of working-age were actively participating in the civilian labor force. This participation rate was 0.8 percentage points higher than the U.S., but the state ranked only 27th highest among the 50 states on this measure of labor force activity (Table 54). The labor force participation rate of the foreign born population of the state in 2005 was 67.0%, statistically identical to that of the native born in our state but was 0.5 percentage points below that of the nation.[26] Massachusetts ranked only 36th highest among the 50 states on this measure for the entire foreign born population. The state fared considerably better on the participation rate of new immigrant arrivals; i.e., those arriving in the U.S. between 2000 and 2005. Nearly 73 percent of new immigrants were actively participating in the civilian labor force of the state in 2005 versus only 67 percent of their national counterparts, a near 6 percentage point advantage in favor of our state. Massachusetts ranked 11th highest among the 50 states with respect to the participation rate of its new immigrant arrivals, largely reflecting the very high rate of labor force attachment among new immigrant males.

Again, we find that Massachusetts was not in 2005 a national leader in the labor force participation rates of its native born or its total foreign born working-age populations. Thus, we conducted a simulation exercise in which we estimated the number of nation born and foreign born individuals who would have been active in the labor force of Massachusetts during 2005 if we had matched the annual average labor force participation rate of the top five performing states for the native born and foreign born populations, respectively, during that year. We first estimated the annual average civilian labor force participation rates of the native born and the foreign born in each state in 2005 and ranked these states from highest to lowest on the basis of their participation rates for each of these two groups. The top five states in each demographic category were identified (Table 55). The top five states for the native born included four Midwestern states and Alaska while the top five states for the foreign born population consisted of three Midwestern states and two southern states (Virginia and Mississippi).[27] We then calculated the simple, unweighted average participation rate of the native born and foreign born in these five states and then estimated how many more native born and foreign born, working-age adults in Massachusetts would have been in the labor force in

Table 56:

Simulations of the Increase in the Number of Civilian Labor Force Participants in Massachusetts in 2005 if the State Matched the Average Labor Force Participation Rates of the Top Five States for the Native Born and Foreign Born

NATIVITY GROUP	AVERAGE PARTICIPATION RATE OF TOP FIVE STATES	PARTICIPATION RATE IN MASSACHUSETTS	INCREASE IN MASSACHUSETTS PARTICIPATION RATE	NUMBER OF PERSONS IN WORKING-AGE POPULATION (IN 1000S)	INCREASE IN CIVILIAN LABOR FORCE PARTICIPANTS (IN 1000s)
Native Born	73.1	66.9	+6.2	4,127	256
Foreign Born	76.3	67.5	+8.8	915	81
Total	—	—	—	5,042	337

2005 if the state had matched the average participation rates of these top five performing states. Findings of our simulation exercise are displayed in Table 56.

During 2005,the labor force participation rate of the native born in Massachusetts would have been 6.2 percentage points higher if the state had matched the participation behavior of the top five ranked states. This would have brought into the labor force of the state an additional 256,000 native born, labor force participants in 2005. If the state had matched the participation rate of the foreign born in the top five ranked states, then the participation rate of the state's foreign born would have increased by nearly 9 percentage points, and this would have generated an additional 81,000 foreign born labor force participants for the state.[28] Thus, by combining the additional number of labor force participants in these two demographic groups, we find an additional 337,000 labor force participants in our state in 2005 if we had been able to match the average performance of the top five ranked states in the nation. This is equivalent to a 10% increase in the size of the state's resident labor force during that year. Massachusetts, thus, seems to be capable of generating substantial labor force growth from within by becoming more of a national leader in the labor force attachment of its existing native born and foreign born residents.

The Labor Force Behavior and Employment Experiences of Poor/Near Poor Householders in Massachusetts

Among the core measures of the economic well-being of families and households is their poverty/near poverty or low income status.[29] While Massachusetts has a below average incidence of poverty and low income problems among its families, the state has not succeeded in reducing the incidence of such problems among its families since the end of the economic boom of the late 1980s.[30] During 2003-2004, slightly under 10 percent of Massachusetts family households and 20 percent of its non-family households were poor or near poor.[31] A high fraction of Massachusetts poor/near poor family householders have been found to have limited attachment to the labor market. Families with a head who worked 1,800 or more hours during the year had an incidence of poverty/near poverty problems of only 2% in recent years.

MASSACHUSETTS SEEMS CAPABLE OF GENERATING SUBSTANTIAL LABOR FORCE GROWTH FROM WITHIN

To identify the labor force behavior and employment experiences of poor/near poor householders under the age of 65, we examined the findings of the American Community Surveys for 2004 for Massachusetts and the U.S. The group being analyzed includes both householders in families and persons heading non-family households. For each group of respondents, we computed values for each of the following six variables:

- The labor force participation rate at the time of the survey
- The unemployment rate at the time of the survey
- The E/P ratio at the time of the survey
- The percent of householders who worked at any point in the twelve month period prior to the survey
- Mean annual hours worked by all poor/near poor householders [32]
- Mean annual hours worked by those poor/near poor householders with some employment in the prior twelve month period

Findings on the labor force participation behavior and employment experiences of poor/near poor householders in Massachusetts and the U.S. are displayed in Table 57. Separate breakouts of the data for men and women are displayed in Table 58, and Massachusetts' rankings among the 50 states and the District of Columbia on several of these measures are presented in Table 59. On every one of these six measures, Massachusetts falls below the average U.S. performance and frequently ranks in the bottom five states.

In 2004, only 50 percent of non-elderly, poor/near poor householders in Massachusetts were actively participating in the civilian labor force (Table 57). This participation rate was 9 full percentage points below the U.S. average, and the state ranked only 48th highest on this measure (Table 59). Male, poor/near poor householders in Massachusetts were somewhat more likely than their female counterparts to be active participants in the labor force (55% vs. 47%), but both groups fared poorly in comparison to each of their respective counterparts in the other states. Both men and women in Massachusetts ranked 47th on this measure of labor force activity.

A relatively high share of poor/near poor householders who were active in the labor force in Massachusetts during 2004 were unsuccessful in finding employment. The unemployment rate among this group was 19%, one percentage point higher than the unemployment rate for all

Table 57:

Comparisons of the Labor Force Participation and Employment Behavior of Non-Elderly Poor and Near Poor Householders in the U.S. and Massachusetts, 2004

	U.S.	MASSACHUSETTS	MASSACHUSETTS – U.S.
Civilian labor force participation rate	59.7%	50.6%	-9.1 percentage points
Unemployment rate	18.0%	19.0%	+1.0 percentage points
E/P ratio	49.0%	41.0%	-8.0 percentage points
Worked in past 12 months	65.2%	56.2%	-9 percentage points
Mean annual hours worked, all	828	642	-186 hours
Mean annual hours worked, employed only	1,270	1,142	-128 hours

Source: 2004 American Community Surveys, public use files, tabulations by authors.

poor/near poor householders across the entire country. Both poor/near poor men and women faced very high rates of unemployment in our state in 2004.

As a consequence of their relatively low rate of labor force participation and their high rate of unemployment, only 41 of every 100 poor/near poor householders in Massachusetts were employed at the time of the 2004 ACS surveys (Table 57). This E/P ratio was 8 percentage points below the U.S. average, and Massachusetts ranked only 45th highest on this measure among the states (Table 59). Poor/near poor male householders in Massachusetts were more likely to be employed than their female counterparts (45% vs. 39%), but both groups ranked low among the 50 states on this measure, ranking only 43rd highest.

There is a fair degree of turnover in the ranks of the employed among poor/near poor householders during the year. Slightly over 56% of the poor/near poor householders in Massachusetts worked at some point during the year (Table 57). This over-the-year employment rate was nine percentage points below the U.S. average in 2004.

Mean annual hours worked by all, non-elderly poor/near poor householders in Massachusetts were only 642. Many of those who did work at some point during the year were employed worked only part-year or part-time. Mean annual hours worked by poor/near poor householders in Massachusetts were 186 hours below the U.S. average of 828. Massachusetts ranked 47th on this measure of annual work effort among the 50 states and D.C. Males in Massachusetts, on average, worked more hours per year than their female peers (787 vs. 566). Both groups, however, worked for far fewer hours than each of their respective counterparts across the country, and they ranked fairly low (46th and 45th for men and women), respectively among their counterparts in each of the other states.

Among those poor/near poor householders in Massachusetts who did work at some time in the prior 12 months, mean annual hours of employment were equal to 1,142. This mean was

Table 58:

Civilian Labor Force Participation Rates, Employment Rates, and Annual Hours Worked by Poor/Near Poor, Non-Elderly Householders in Massachusetts and the U.S. by Gender, 2004

	U.S.	MASSACHUSETTS	MASSACHUSETTS – U.S.
Civilian labor force participation rate			
Men	65%	55%	-10 percentage points
Women	48%	57%	-9 percentage points
Employment rate			
Men	54%	45%	-9 percentage points
Women	39%	46%	-7 percentage points
Mean annual hours worked			
Men	787	994	-207 hours
Women	566	724	-158 hours

Table 59:

Massachusetts' Rankings Among the 50 States and the District of Columbia on Key Labor Force Participation and Employment Measures for Poor/Near Poor Non-Elderly Householders, 2004

	MASSACHUSETTS RANK
Civilian Labor Force Participation Rate	
All	48th
Men	47th
Women	47th
Employment Rate	
All	45th
Men	43rd
Women	43rd
Mean Annual Hours Worked	
All	47th
Men	46th
Women	45th

Source: 2004 American Community Surveys, public use files, tabulations by authors.

Table 60:

The Five States with the Highest Labor Force Participation Rates and Employment Rates for Poor/Near Poor Householders Under Age 65, 2004 (in percent)

STATE	LABOR FORCE PARTICIPATION RATE	STATE	EMPLOYMENT RATE
Utah	71	Utah	64
Nebraska	70	South Dakota	62
South Dakota	70	New Mexico	58
Iowa	68	Nebraska	57
Colorado	68	Idaho	57
Average of Above Five States	69	Average of Above Five States	60

128 hours below the U.S. average for employed poor/near poor householders. Even among those who did work, there appears to be considerable room for improving annual hours of labor supply. A substantive increase in average annual hours of work also would improve their prospects for obtaining annual earnings high enough to allow them to escape from the ranks of the poor/near poor.

As was the case for many other demographic/socioeconomic subgroups in our state, poor/ near poor householders ranked comparatively low among all states in their labor force participation and employment rates in 2004. We conducted a relatively simple simulation exercise in which we estimated the impact on the number of poor/near poor householders who would have been in the labor force and employed during 2004 if Massachusetts had matched the performance of the top five states on each of these two measures. During 2004, the top five states had civilian labor force participation rates for poor/near poor householders ranging from 68% (Colorado and Iowa) to a high of 71% in Utah, with an unweighted average of 69.4%. If Massachusetts had achieved a participation rate of 69% for its poor/near poor householders in 2004, there would have been an additional 43,400 poor/near poor householders in the labor force of the state (Table 61).

The five states with the highest employment rate for their poor/near poor householders had employment rates ranging from 57% in Idaho and Nebraska to a high of 64% in Utah, with an average of just under 60% (Table 60). If Massachusetts had been able to obtain a 60% employment rate for its poor/near poor householders rather than the 41% actually achieved, then there would have been an additional 43,000 employed poor/near poor householders in the state in 2004.

Future efforts to boost the labor force attachment and employability of poor/near poor householders in the Commonwealth can help simultaneously achieve a number of important economic and social goals, including growth in the size of the state's resident labor force, a reduction in labor shortages in selected occupational areas, and a decrease in the number of poor/near poor families and households across the state. Since many

Table 61:

Simulating the Impacts on the Number of Labor Force Participants and Employed Poor/Near Poor Householders in Massachusetts if the State Matched The Performance of the Top Five States in the U.S., 2004

VARIABLE	AVERAGE PERFORMANCE OF TOP FIVE STATES (IN %)	MASSACHUSETTS PERFORMANCE (IN %)	ADDITIONAL NUMBER OF MASSACHUSETTS P/NP HOUSEHOLDERS IN GROUP
Civilian Labor Force Participation Rate	69	51	43,428
Employment Rate	60	41	43,058

of the poor/near poor families have children, an improvement in their economic well being would also strengthen the lifetime educational and economic prospects for the children residing in these families.

Tapping the Unutilized Disabled Population As a Source of Future Labor Force Growth

The preceding sections have revealed that Massachusetts has experienced labor force declines for the past three years and will experience comparatively low labor force growth in the future unless labor force participation rates of key demographic subgroups are improved. There are a variety of underutilized labor pools upon which workforce development policy makers can focus in securing additional workers for the state. One such potential labor pool is the disabled working age population of the state. Recent research undertaken by the Center for Labor Market Studies has revealed that a large number of disabled persons could be brought into the labor force to fill the existing labor shortages by boosting their labor participation rates.[33] During 2003-2004, there were 509,000 disabled persons in the 16-74 age group in Massachusetts, accounting for slightly over 11 percent of the 16-74 year old population of the state. Of these 509,000 disabled persons, only 183,000 or 36 percent were active participants in the state's labor force. Massachusetts ranking among the 50 states on the labor force participation rates for the adult disabled population was 15th lowest (Table 62). Thus, there is a potential opportunity for boosting the labor force participation rates of the working-age disabled, bringing more of them into the active labor force of the state and increasing the size of the state's labor force.

In Massachusetts only 36 of every 100 members of the 16-74 year old disabled population participated in the labor force in 2003-2004. Their participation rate was equal to only half the labor force participation rate of the non-disabled in our state. This finding was not unique for our state, but prevailed for the U.S. as well (Table 63). It is consistently found in national and local research studies that additional years of formal schooling boost the labor force participation rate of the working-age population. Among the adult disabled, the labor force participation rate was the lowest for those without a high school diploma/GED and highest for those with a four-year or higher college degree. For disabled adults in Massachusetts, the labor force participation rate was only 23 percent among high school dropouts, 33 percent among high school graduates, 44 percent among those with 1-3 years of college, and 55 percent among those with a Bachelor's or higher degree.

A LARGE NUMBER OF DISABLED PERSONS COULD BE BROUGHT INTO THE LABOR FORCE

As noted earlier, Massachusetts ranking among all 50 states on the labor force participation rate for the adult disabled was 15th lowest. During 2003-2004, the labor force participation rates of the disabled across states varied widely,

Table 62:

Number of 16-74 Year Old Disabled Persons in Massachusetts and the U.S. and Their Labor Force Participation Rates, 2003-2004 Averages

GROUP	MASSACHUSETTS	U.S.
Civilian Labor Force	183,535	10,034,293
16-74 Year Old Population	508,926	27,270,783
Labor Force Participation Rate	36.1	36.8
Massachusetts Ranking Among the 50 States	15th Lowest	

Table 63:

Labor Force Participation Rates of 16-74 Year Olds in Massachusetts and the U.S., Total and by Educational Attainment, 2003-2004 Averages (numbers in percent)

	MASSACHUSETTS			U.S.		
GROUP	NOT DISABLED	DISABLED	ALL	NOT DISABLED	DISABLED	ALL
All	78.4	36.1	73.6	75.5	36.8	70.3
<12 or 12, No HS Diploma	58.5	22.9	50.3	58.3	24.3	50.9
HS Diploma/GED	76.7	33.1	70.5	75.7	36.2	69.7
1-3 Years of College, including Associate's Degree	80.7	43.6	76.8	79.1	45.3	75.1
Bachelor's Degree	83.9	54.8	82.3	81.9	51.1	79.9
Master's or Higher Degree	85.3	54.8	84.0	83.2	52.5	81.1

ranging from a low of only 23 percent in West Virginia to a high of 51 percent in Alaska (Table 64). The average participation rate of the disabled in the five states with the highest participation rates for the disabled was 49 percent. If Massachusetts were to raise labor force participation rate of the disabled to the average of the five states with the highest labor force participation rates for the disabled, how many more disabled would be in the labor force? From our simulation exercise for Massachusetts, we find that there would be approximately 66,000 more disabled persons in the labor force if the labor force participation rate of Massachusetts' disabled matched that of the top five states.

The labor force participation rates for 16-74 year old disabled persons during 2003-2004 in the top five states ranged from 48 to 51 percent. The states with the highest labor force participation rates for the disabled were Alaska (50.9%),

Table 64:

Simulating the Labor Force Impacts of Increasing the Labor Force Participation Rate of 16-74 Year Old Disabled Persons in Massachusetts To the Average of the Top Five States with the Highest Labor Force Participation Rate for Disabled, 2003-2004 Averages

STATE	LABOR FORCE PARTICIPATION RATE	RANKING OF LFPR	LABOR FORCE	TOTAL 16-74 YEAR OLD POPULATION
Alaska	0.509	1st Highest	34,831	68,373
Wyoming	0.487	2nd Highest	180,903	371,329
Utah	0.487	3rd Highest	28,191	59,026
Minnesota	0.487	4th Highest	82,167	168,604
South Dakota	0.478	5th Highest	25,256	51,808
Average of Top 5 States	0.490			
Massachusetts	0.361	37th Highest	183,535	508,926
Massachusetts- Top 5 States	-0.129			
Increase in the number of disabled labor force participant			65,839	
If Massachusetts Labor Force Participation was raised to 49 percent, projected disabled labor force would be	.490		249,374	

Source: 2003 and 2004 American Community Surveys, U.S. Census Bureau, tabulations by authors.

Wyoming (48.7%), Utah (48.7%), Minnesota (48.7%) and South Dakota (47.8%). The simple average of these five states' labor force participation rates was 49 percent. During the same two years, the labor force participation rate of the 16-74 year old disabled population in Massachusetts was only 36.1 percent, 13 percentage points below the top five states' labor force participation rate.

If the labor force participation rate was raised to 49 percent, then, there would be 66,000 additional disabled persons in the labor force. Boosting the labor force participation rate of the disabled working-age disabled population to 49 percent increase the resident labor force of the state by 2 percent.

Endnotes

1. While these five states combined had smaller Black and Hispanic populations than Massachusetts, they had a larger Native American Indian population, which has below average participation rates. The White, non-Hispanic share of the working-age population of these five states was 86.9% versus 82.6% in Massachusetts in 2005.
2. Substituting the race-ethnic distribution of the working-age population of these five states in 2005 for that of Massachusetts and applying the Massachusetts participation rates for these five groups would only have raised the Massachusetts participation rate by 0.1% in 2005.
3. *See*: Andrew Sum, Ishwar Khatiwada, Nathan Pond, et al, *The Absent Male Worker and the Limited Growth in New England's Labor Force in the 1990s: Implications for Future Educational and Workforce Development Policy*, Report Prepared for the New England Regional Office of the Employment and Training Administration, U.S. Department of Labor, Boston, July 2002.
4. An established immigrant is one who arrived in the U.S. prior to 1990. Not all of these immigrants chose Massachusetts as their initial home. Some first came to the other states especially New Jersey and New York before arriving in Massachusetts.
5. *See*: Andrew Sum and Paul E. Harrington, *New Immigrant Workers in the U.S. and Their Impacts on Younger Native Born Workers and the Structure of U.S. Labor Markets*, Report Prepared for the Center for Immigration Studies, Washington, D.C., 2006.
6. The .5 percentage point difference between the estimated labor force participation rates of males in Massachusetts and the U.S. in 2005 was not statistically significant at the .05 level.
7. In 1960, the working-age population was defined as those 14 and older. By the time of the 1970 Census, the lower age limit had been raised to 16.
8. For a review of neoclassical economic models of labor force participation and labor supply, *See*: (i) Solomon W. Polachek and W. Stanley Siebert, *The Economics of Earnings*, Cambridge University Press, New York, 1993; (ii) Francine D. Blau, Marianne A. Ferber, Anne E. Winkler, *The Economics of Women, Men, and Work (Third Edition)*, Prentice Hall, Upper Saddle River, New Jersey, 1998.
9. A more recent analysis of the labor supply behavior of married women over the 1980-2000 period finds that the responsiveness of the labor supply of married women to their wages has diminished considerably over the past few decades. *See*: Francine D. Blau and Lawrence M. Kahn, *Changes in the Labor Supply Behavior of Married Women: 1980-2000*, Working Paper 11230, National Bureau of Economic Research, Cambridge, March 2005.
10. For a detailed review of changes in the labor force behavior of the older population of the nation over the past decade, *See*: Andrew Sum, Ishwar Khatiwada, and Paulo Tobar with Sheila Palma, *The Labor Force Behavior of the Nation's Older Population, 55 and Older: Past, Current, and Projected Trends and Their Implications for Future Older Worker Employment Policy in the U.S.*, Report Prepared by the Center for Labor Market Studies, Northeastern University, Boston, for Senior Service America, Silver Springs, Maryland, 2005.
11. For a review of national labor force projections through 2014 by age group and gender, *See*: Mitra Toossi, "The Labor Force," in *Employment Outlook: 2004-2014, Monthly Labor Review*, November 2005, pp. 25-44.
12. The top five performers in each age group do vary across these eight age groups.
13. *See*: Joseph McLaughlin, Andrew Sum, and Ishwar Khatiwada, *Still Young, Idle, and Jobless: The Continued Failure of the Nation's Teens to Benefit from Renewed Job Growth*, Paper Prepared for Jobs for America's Graduates, Alexandria, Virginia, January 2006.
14. The national teen E/P ratio in 2005 was 36.5%, statistically identical to the E/P ratio in the prior calendar year.
15. See: (i) Andrew Sum, Kamen Madjarov, & Joseph McLaughlin, *The Deterioration in the Labor Market Fortunes of Massachusetts High School Students and Young Dropouts, 2000-2004: Implications for the Connecting Activities and Other Workforce Development Programs to Boost Teen Employment Prospects*, Report Prepared for the Boston Workforce Solutions Group and The Commonwealth Corporation, April 2006; (ii) Andrew Sum, Ishwar Khatiwada with Abbe Will and Sheila Palma, *The Decline in Work Experience Opportunities Among Massachusetts and U.S. Teens (16-19) Between 1999 and 2003-2004: Implications for Youth Workforce Development Policy*, Report Prepared for The Commonwealth Corporation, April 2006.

16. The ACS surveys use a questionnaire quite similar to that of the long-form questionnaire used in the 2000 Census. The U.S. Census Bureau obtained completed interviews from approximately 12,750 households in the state during the 2004 ACS survey. Interviews were carried out during all 12 months of the year.

17. Hispanics can be members of any race. In our analysis, they are excluded from the counts of Asians, Blacks, and Whites.

18. A high school dropout is defined as a 16-19 year old who was not enrolled in school at the time of the ACS survey and did not possess either a high school diploma or a GED certificate. High school students on summer vacation would be classified as an active high school student not as a dropout.

19. Even at the peak of the labor market boom in 2000, young dropouts in the city of Boston found it much more difficult to find employment than their peers in the nation's 50 largest cities, *see*: Tracy Jan, "Job Market for Dropouts Tougher in Hub," *The Boston Globe*, April 6, 2006, p. B-1, 3.

20. See: Andrew Sum, Ishwar Khatiwada, et. al., *The Economic and Social Benefits of Completing Additional Years of Schooling: A State by State Analysis of the Jobs for America's Graduates Network*, Report Prepared for Jobs for America's Graduates, Alexandria, Virginia, November 2005.

21. All of these labor force participation rate estimates are based on the findings of the 1990 and 2000 Censuses of Population and Housing.

22. For a review of employment and unemployment developments in Massachusetts during the 1990s, *See*: Andrew Sum, Paul Harrington, et.al., *The State of the American Dream in Massachusetts, 2002…*

23. The considerably lower participation rate of those lacking a high school diploma is partly attributable to the inclusion of 16-19 year old high school students in this group. If we raise the lower age limit for high school dropouts to those 20 and older, the participation rate in 2003-2004 based on the ACS surveys for these two years would have risen to 46.5%.

24. The opportunity cost of any activity in economic theory is the value of the highest opportunity foregone by engaging in this activity. The opportunity cost of leisure is typically viewed as the after-tax market wage.

25. Part of this gain would be among college students as well as out-of-school adults with 1-3 years of post-secondary schooling.

26. The difference between the labor force participation rates of the foreign born in Massachusetts and the U.S. was not large enough to be classified as statistically significant.

27. The annual average labor force participation rates of the native born in each of these five states were significantly higher than that of Massachusetts during 2005.

28. A test of the statistical significance of the difference between the participation rates of the foreign born in the top five states combined and that of Massachusetts was statistically significant at the .01 level.

29. The "near poor" are defined as those with an annual money income above the federal government's poverty line but less than 125% of the poverty line. The low income are those with an annual money income below 200% of the federal government's poverty income thresholds.

30. For a recent assessment of income inadequacy problems among Massachusetts families, *See*: Andrew Sum, Ishwar Khatiwada, Jacqui Motroni with Sheila Palma, *Poverty, Near Poverty, and Other Low Income Problems Among Families in Massachusetts 2003-2004: Implications for Workforce Development Policy*, Report Prepared for The Commonwealth Corporation, Boston, 2006.

31. In accord with U.S. Census Bureau definitions, a "family household" consists of two or more persons who are related to each other by blood, marriage, or adoption. Non-family households can consist of persons living on their own or with others to whom they are not related.

32. The ACS survey collected data on weeks worked in the 12 month period prior to the survey, including weeks of paid vacation, sick leave, and military service, and on average hours worked per week. Annual hours of work were computed by multiplying weeks worked by average hours per week. Those persons with no weeks of employment in the prior 12 months were assigned annual hours of work equal to zero.

33. See: Ishwar Khatiwada, Andrew Sum and Joseph McLaughlin, *The Labor Force Behaviors, Employment and Earnings Experiences of the Disabled Working-Age Population in Massachusetts, New England, and the U.S. in 2003 and 2004*, Center for Labor Market Studies, Northeastern University, Prepared for The Commonwealth Corporation and The Massachusetts Rehabilitation Commission, Boston, June 2006.

V. LABOR UNDERUTILIZATION PROBLEMS

Labor Underutilization Problems in Massachusetts: Their Changing Size, Incidence Among Key Demographic Groups, and Their Economic and Social Consequences

The preceding sections of this report have assessed changes in the size of the state's resident labor force and the labor force behavior of a wide array of demographic and socioeconomic subgroups of the working-age population. Being in the labor force does not guarantee that a worker has a job, is able to work his/her desired hours of work, or fully utilize their skills on the job. In addition, there are jobless persons who desire to be employed but are not counted as members of the official civilian labor force since they do not meet the active job search or availability for work criteria underlying the unemployment measures. This section of the report will provide our estimates of the number of Massachusetts adults who were unutilized or underutilized in 2005, changes in the pool of these underutilized workers over the past five years, the educational backgrounds and ages of those experiencing these various types of underutilization problems, and assess the economic and social consequences of these labor underutilization problems in the Commonwealth.[1]

Our analysis of labor underutilization problems will focus on the following three mutually exclusive groups: the unemployed, the underemployed, and the members of the so-called labor force reserve. The unemployed are those adults who were not working during the reference week of the CPS survey and were not temporarily absent from a job for such reasons as vacation, sick leave, or weather, but had been actively looking for work during the past four weeks and were available to take a job in the reference week.[2] The labor force reserve consists of those individuals who reported to the CPS interviewers that they wanted an immediate job even though they were not actively looking for work.[3] The underemployed are those persons who were working part-time (under 35 hours per week) during the reference week of the survey but wished to be working full-time. They may have experienced reduced hours due to slack demand at their firm or simply been unable to find a full-time job. On average, they worked only 24 to 25 hours per week. Estimates of the size of each of these three groups of unutilized and underutilized adults and their distribution by educational attainment are displayed in Table 65. The estimates are annual averages for calendar years 2000 and 2005.

The annual average number of unemployed adults in 2000 in Massachusetts was only 91,246 yielding an unemployment rate of only 2.7%.[4]

BEING IN THE LABOR FORCE DOES NOT GUARANTEE THAT A WORKER HAS A JOB

(Chart 28). This unemployment rate was well below the national average of 4.0% and was fourth lowest in the U.S. among the 50 states. The unemployment rate was the lowest that the state had experienced in the more than 30 year period for which state CPS unemployment data were available. Unemployment rates of Massachusetts adults in 2000 did, however, vary fairly markedly by educational attainment, ranging from a high of 6.8% for those lacking a high school diploma or GED to 3.0% for high school graduates with no post-secondary schooling to a low of only 1.1% for those with a Master's or higher degree (Chart 29). The unemployment

Table 65:

Labor Underutilization Problems in Massachusetts, Total and by Educational Attainment Level, 2000 and 2005 (Annual Averages)

2000	CLF	UNEMPLOYED	UR	WORKING PART-TIME FOR ECONOMIC REASONS	LABOR FORCE RESERVE	UNDER-UTILIZED POOL	ADJUSTED CLF	UNDER-UTILIZATION RATE
<12 or 12, No Diploma	362,448	24,556	6.8%	14,277	19,812	58,645	382,260	15.3%
High School Graduate	933,244	27,948	3.0%	19,048	16,529	63,525	949,773	6.7%
Some College	817,979	18,715	2.3%	13,204	12,227	44,146	830,206	5.3%
Bachelor's Degree	773,351	15,009	1.9%	6,327	6,044	27,380	779,395	3.5%
Master's or Higher Degree	442,350	5,018	1.1%	3,387	2,843	11,248	445,193	2.5%
Total	3,392,372	91,246	2.7%	56,243	57,455	204,944	3,386,827	6.1%

2005	CLF	UNEMPLOYED	UR	WORKING PART-TIME FOR ECONOMIC REASONS	LABOR FORCE RESERVE	UNDER-UTILIZED POOL	ADJUSTED CLF	UNDER-UTILIZATION RATE
<12 or 12, No Diploma	318,902	36,835	11.6%	18,095	18,938	73,866	336,840	21.9%
High School Graduate	914,656	54,815	6.0%	29,146	20,444	104,405	935,100	11.2%
Some College	784,688	37,112	4.7%	19,621	21,008	77,741	805,696	9.6%
Bachelor's Degree	810,496	32,028	4.0%	16,475	9,374	57,877	819,870	7.1%
Master's or Higher Degree	544,383	8,534	1.6%	3,378	8,246	20,158	552,629	3.6%
Total	3,373,125	169,324	5.0%	86,715	78,010	334,049	3,451,135	9.7%

rate of high school dropouts in 2000 was six times as high as that of Massachusetts adults with a Master's or more advanced degree.

The level and rate of unemployment rose sharply in Massachusetts from 2000 through 2003 more than doubling over this period. In the U.S. the level of unemployment rose by only 60% between 2000 and 2003. In 2004, unemployment in the state diminished somewhat with the unemployment rate dropping from 5.8% to 5.1%. However, this drop occurred as a consequence of a decline in the size of the resident labor force rather than an improvement in the number of employed.[5] During 2005, the annual average level of unemployment in the state was estimated at slightly under 170,000 based on the findings of the CPS household surveys, yielding an annual average unemployment rate of 5.0%. The 2005 unemployment rates for each of the five educational subgroups were above those in 2000; however, the size of the percentage point increases in these unemployment rates varied markedly by educational subgroup, ranging from 5 percentage points among adults lacking a high school diploma to 3 percentage points among high school graduates with no post-secondary schooling, and to a low of only 0.5 percentage points for those with a Master's or higher degree (Chart 29). In 2005, the unemployment rate of adults lacking a regular high school diploma or a GED was seven times as high as that of adults with a Master's or higher degree.

IF JOBS DO NOT SEEM TO BE AVAILABLE, PEOPLE WILL STOP ACTIVELY LOOKING FOR WORK

The labor underutilization problems of the

state's adults go far beyond the official unemployment statistics. The labor force participation behavior of some working-age adult groups, including teens, 20-24 years olds, married women, and less educated adults, tend to be cyclically sensitive, declining during period of job loss and increasing unemployment and rising during boom periods in the labor market. If jobs do not seem to be available to them, they will stop actively looking for work and no longer be counted as unemployed in the CPS survey.[6] Yet, some of these adults would be willing to accept jobs if they were offered to them. In conducting the CPS survey, interviewers ask each working-age household member who was neither working nor actively looking for work if they wanted a job at the time of the survey. As noted above, those persons who express an interest in immediate paid employment are counted as members of the labor force reserve.

One average, during 2005, there were 78,100 Massachusetts adults who were members of the labor force reserve (Table 65). The official size of the labor force reserve in 2005 was 21,000 higher than in 2000. Approximately 5 of every 100 adults not active in the labor force were members of the labor force reserve. While the labor force reserve in 2005 included persons from each of the five educational attainment subgroups, a disproportionate share of the labor force reserve was composed of individuals who either lacked a high school diploma or had no formal schooling beyond the high school diploma/GED. Slightly over 50 percent of the members of the labor force reserve in 2005 had no formal schooling beyond the twelfth grade though they only accounted for 37% of the state's resident civilian labor force during that year. While college educated adults with a Bachelor's or higher degree were underrepresented among the ranks of the

Chart 28:

Trends in Unemployment Rates in Massachusetts and How it Ranks Among the 50 States, Selected Years 2000-2005 (Annual Averages)

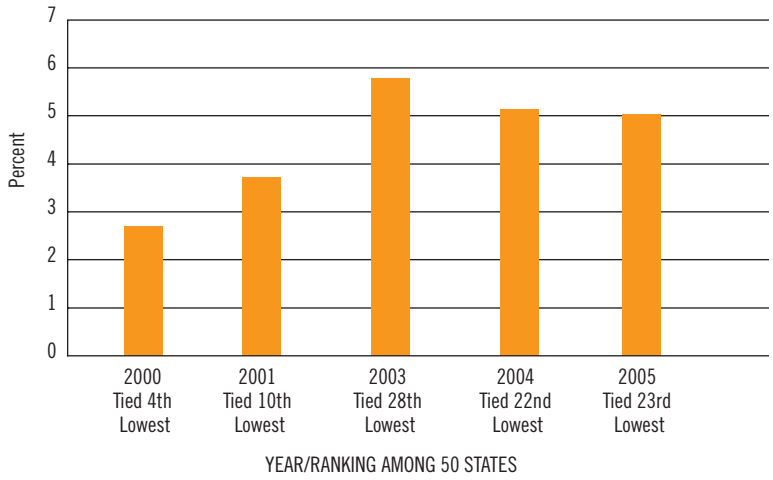
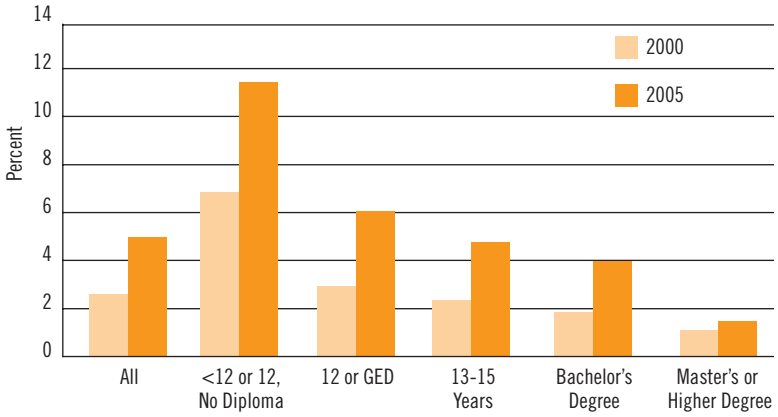


Chart 29:

2000 and 2005 Unemployment Rates of Massachusetts Adults 16 and Older, All and Educational Attainment (Annual Averages)



labor force reserve, there were nearly 18,000 college graduates in the labor force reserve on an average month in 2005.

The third component of the pool of underutilized labor consists of those who were underemployed during 2005. Our definition of underemployed is that of an employed individual who was working part-time (fewer than 35 hours per week) at the time of the CPS survey for economic

reasons (slack work at the firm, material shortages that reduced the work week, an inability to find a full-time job)[7] rather than voluntarily. The considerably lower average weekly hours of work among the underemployed (24-25 hours versus 42-43 among the full-time employed) reduces their weekly earnings, their household's income, and the output of the state economy.

HIGH LABOR UNDERUTILIZATION RATES GENERATE A NUMBER OF ECONOMIC AND SOCIAL COSTS.

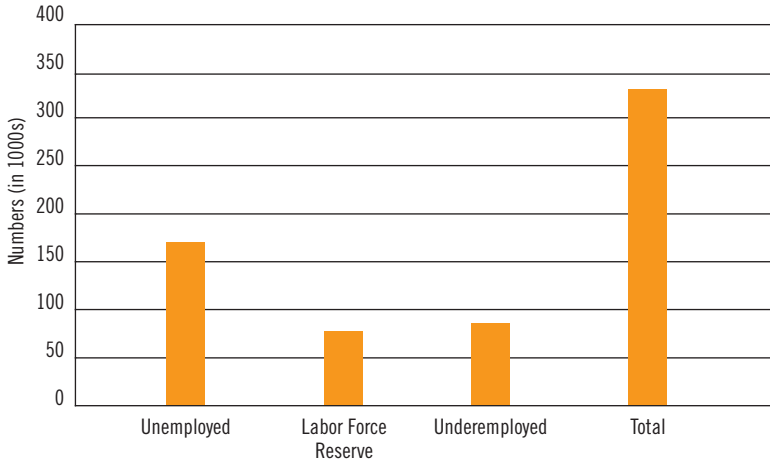
During 2005, on average, there were slightly under 87,000 individuals in Massachusetts who worked part-time for economic reasons (Table 65). This pool of underemployed individuals in 2005 was considerably greater than in 2000 when only 56,000 were categorized as underemployed. The number of underemployed persons in 2005 was higher than in 2000 for each educational subgroup except for those holding a Master's or higher degree, whose numbers were unchanged between 2000 and 2005. A disproportionate share of the state's underemployed were accounted for by those workers with 12 or fewer years of schooling. These workers with no completed years of post-secondary schooling represented nearly 55 percent of the underemployed but only 36 percent of the employed. The underemployment rates (underemployed as a % of the employed) of Massachusetts workers in 2005 ranged from a low of only 0.6 percent among those with a Master's or higher degree to a high of 6.4% among those workers lacking a high school diploma or a GED, a relative difference of nearly 11 times between the top and bottom rates.

The combined pool of unutilized and underutilized labor in Massachusetts can be obtained by summing the counts of the estimated number of unemployed, members of the labor force reserve, and the under-employed (Table 65 and Chart 30). An underutilization rate is obtained by dividing this combined pool of underutilized and unutilized labor by the size of the adjusted civilian labor force. This latter measure is obtained by adding the labor force reserve to the civilian labor force.[8] During 2005, the annual average combined pool of unutilized and underutilized labor in Massachusetts was estimated to be slightly over 334,000, yielding an underutilization rate of 9.7% (Chart 31). The estimated underutilization rate in 2004 was 9.4% while that in 2000 was only 6.8%. (Table 65).[9] There were 130,000 more unutilized and underutilized workers in 2005 than in 2000 in our state, a relative increase of 63 percent.

Underutilization rates in 2005 were higher than they were in 2000 for workers in each of the five educational subgroups, but the percentage point increases in these rates varied widely across these five groups (Chart 31). Among workers with no high school diploma/GED, the labor underutilization rate increased by 6.6 percentage points, among high school graduates by 4.5 per-

Chart 30:

The Pool of Unutilized and Underutilized Adults in Massachusetts, Total and by Type of Problem, 2005



centage points, among Bachelor degree holders by 3.6 percentage points, and among Master's degree and higher degree recipients by only 1.1 percentage points.

Labor underutilization problems for Massachusetts adults in 2000 and 2005 also were calculated for eight age subgroups, ranging from teenagers (16-19) to elderly adults (65 and older). Between 2000 and 2005 the underutilization rates of each of these age subgroups rose sharply, but the percentage point increases were largest for the three age cohorts under the age of 30. The underutilization rates of these three younger subgroups rose by 6 to 8 percentage points between 2000 and 2005. The underutilization rates of these eight age subgroups in 2005 varied quite considerably, being highest for teens and young adults (20-24) then declining steadily with age until the 55-64 age group is reached.

Nearly 1 of every 4 teenagers in the adjusted labor force and close to 1 of every 5 20-24 year old young adults were unutilized or underutilized. Not only do Massachusetts teens and young adults face high open unemployment rates, but they also comprise a relatively high share of the labor force reserve and are the most likely to be underemployed.[10] Young college graduates also were encountering higher mal-employment rates in 2005, i.e., being employed in jobs not requiring a college degree. Mal-employment leads to lower annual earnings and reduces the private and social rate of return to college investment. If not significantly reduced in the near future, these high rates of underutilization among the state's young adults may lead to higher levels of outmigration from the state, a development the state can ill afford.

These high labor underutilization rates (which exclude problems of mal-employment resulting from underutilization of one's education and skills) generate a number of economic and social costs. They reduce the amount of labor that enters the production process, thereby reducing the level of real output of goods and services in the state economy. By reducing both paid hours of work and hourly wages for some groups, they reduce the aggregate earnings of workers, and the average levels of household and family incomes.[11] The lost labor time reduces the work experience of the unutilized and underutilized, thereby reducing their future productivity and wages. Lower wage and salary incomes reduce state income taxes and state sales tax receipts.

Chart 31:

Underutilization Rates in Massachusetts, Total and by Educational Attainment Level, 2000 and 2005 (Annual Averages)

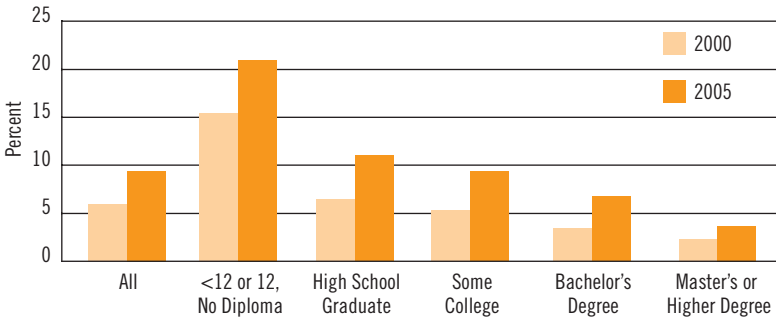
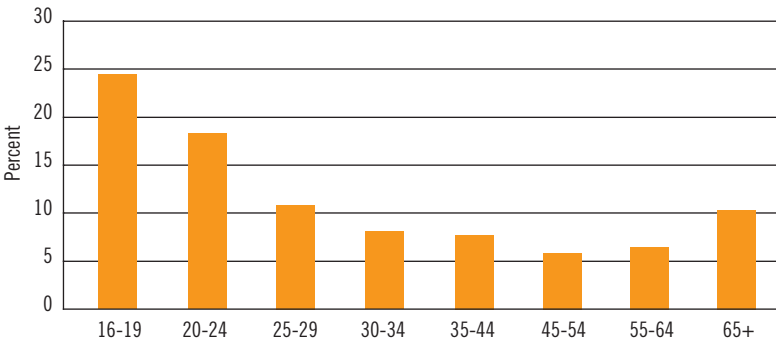


Chart 32:

Estimated Labor Underutilization Rates for Working-Age Adults in Massachusetts by Age Group, 2005



Less employment and lower earnings increases the number of persons receiving cash and in-kind transfers from the federal and state government, including unemployment insurance benefits, TANF benefits, Supplemental Security Income for the disabled and aged, food stamps, rental subsidies, and Medicaid benefits. Higher levels of unemployment also are associated with a greater incidence of mental depression, physical health problems, social isolation, and unhappiness.[12]

Endnotes

1. For an earlier review of emerging labor market problems in Massachusetts and their implications for state workforce development policy, *See*: Andrew Sum, Ishwar Khatiwada, and Sheila Palma, *Current Massachusetts' Labor Market Challenges and the Workforce Solutions Act of 2005*, Testimony for the Massachusetts Legislature's Committee on Labor and Workforce Development Hearings on the Workforce Solutions Act, The State House, Boston, May 2005.
2. The CPS survey is undertaken during the calendar week containing the 19th day of the month, while the reference week is the calendar week prior to the survey, i.e., the week containing the 12th day of the month.
3. The 2000 unemployment estimates are based on the CPS public use files with population weights based on the 2000 Census.
4. The 2000 unemployment estimates are based on the CPS public use files with population weights based on the 2000 Census.
5. During 2004, resident employment in Massachusetts as measured by the LAUS survey fell by nearly 10,000.
6. As noted above, some active job search over the past four weeks is required for an individual to be classified as unemployed. Persons engaging in passive job search, such as reading newspaper want ads or surfing Internet job sites, dot no get counted as unemployed. The CPS survey also allows for proxy respondents. Adult family members, especially mothers, often respond for their teenaged children. Previous national research and recent research on 16-21 year olds in low income neighborhoods across the country shows that parents tend to understate both unemployment and employment among their teenaged children. *See*: (i) Michael E. Borus (Editor), *Youth and the Labor Market*, W.E. Upjohn Institute for Employment Research, Kalamazoo, 1982; (ii) Westat, Inc., "Findings on the Labor Force Activity Status of YOG Target Area Youth Base on Interviewers with Youth and Proxy Respondents," memo, August 2006.
7. Some of the employed working part-time for economic reasons usually work full-time while many others only work part-time on a regular basis.
8. The members of the labor force reserve are not included in the official civilian labor force statistics since they were not actively looking for work at the time of the CPS surveys.
9. The 2004 estimates of the pool of unutilized and underutilized workers and the underutilization rate appear in the following publication: Andrew Sum, Ishwar Khatiwada, with Sheila Palma, *Current Massachusetts' Labor Market Challenges and the Workforce Solutions Act of 2005…*
10. During 2005, persons under 25 comprised 28,000 of the entire 78,000 members of the labor force reserve or 36%. Yet, these two age groups made up only 14% of the official civilian labor force of the state.
11. Persons who are under-employed tend to receive lower hourly earnings from part-time jobs as well as considerably fewer hours of work per week.
12. A variety of national happiness surveys reveal that the unemployed, *ceteris paribus*, express a significantly lower level of happiness. *See*: (i) Bruno S. Frey and Alois Slutzer, *Happiness and Economics*, Princeton University Press, Princeton, 2002; (ii) Carol Graham and Stefano Pettinato, *Happiness and Hardship: Opportunity and Insecurity in New Market Economies*, Brookings Institution Press, Washington, D.C., 2002; (iii) Rafael D. Tella and Robert MacCulloch, "Some Uses of Happiness Data in Economics," *The Journal of Economic Perspectives*, Volume 20, Number 1, Winter 2006, pp.25-46.

VI. THE ABSENCE OF LABOR FORCE GROWTH: SHOULD WE BE WORRIED?

Domestic Out-Migration and the Absence of Labor Force Growth in Massachusetts: Should We Be Worried?

The above findings on recent population and labor force developments in Massachusetts appear to be troublesome. The state has experienced high levels of domestic out-migration since 2001 that have reduced the growth of the state's overall population and its working-age population. The native born, working-age population has declined over the past five years, increasing the state's dependence on new foreign immigrant inflows to keep the working-age population from actually declining. The state's resident labor force has declined for three consecutive years and is on the verge of declining for a fourth consecutive year based on labor force developments through the first six months of 2006.[1]

Should these demographic and labor force developments be viewed as worrisome by state and local economic policymakers and political leaders? There are several schools of thought on desirable population policy and competing views on the importance of labor force growth. There are those groups, including the Zero Population Growth and Negative Population Growth advocates, who claim that a stable if not a lower population could generate a number of desirable environmental, economic, and social goals.[2] Stabilizing the population, they claim, would help conserve natural resources, improve the environment, reduce traffic congestion and urban sprawl, provide more open space, reduce aggregate government expenditures, and facilitate the absorption of existing immigrants into the fabric of American society. Some claim that lower population growth would increase the economic incentives for employers to reach deeper into the pool of available state residents for their workers, increase training investments in their front line workers and expand physical capital investments, thereby helping to boost labor productivity and GSP per capita. If employers did more aggressively recruit existing residents for their available slots, then lower population growth would boost the labor force participation rate of the state.

Another school of thought, including the views of the authors of this report, argues that the high levels of domestic out-migration and labor force decline should be viewed as troublesome by state and local economic policymakers and the business/organized labor community. Labor force growth is primarily influenced by the growth of the resident working-age population. High levels of domestic out-migration combined with the selectivity of this out-migration (the loss of younger, better educated adults with strong ties to the labor market) can reduce both the size and human capital quality of the resident labor force, actually depressing labor force participation rates of remaining residents and contributing to a further graying of the labor force. The reduced available supply of labor can make the state a less attractive place to do business, leading to their expansion elsewhere, the actual relocation of existing firms, and a reluctance to invest in new facilities in Massachusetts. If these responses do occur, this will lead to lower employment growth, lower labor productivity growth, and lower levels

A REDUCED SUPPLY OF LABOR CAN MAKE A STATE A LESS ATTRACTIVE PLACE TO DO BUSINESS

of real output of goods and services.

To test out the validity of these alternative hypotheses about the importance of population and labor force growth for employment, output, and labor productivity growth, we have constructed a data base containing information on growth in the working-age population, the civilian labor force, employment, real output, and labor productivity of states over two time periods: 1989-1999 and 2000-2004. With this state cross-sectional and time series data set, we have estimated the degree of statistical correlation between pairs of these variables, especially between the growth rates of the working-age population and the resident labor force/labor force participation rates and between the growth of the resident labor force and state employment, real output, and labor productivity. To better understand the real output and labor productivity measures appearing in this analysis, we will begin by reviewing the real output concepts and measures for state economies and describe their use in constructing labor productivity measures. We also will present the core elements of a supply GDP model that links each of the demographic, labor force, employment, annual hours of work, and labor productivity variables to explain how they jointly influence the level of real output and real output per capita of state economies.

Gross State Product and Labor Productivity Concepts and Measures

Our real output measures in this analysis represent Gross State Product. Gross State Product (GSP) is a core measure of aggregate production activity within a state. It measures the total market value of all goods and services produced by the property and labor that is physically located in a state during a calendar year. It is approximately the state equivalent of a nation's Gross Domestic Product (GDP). GSP is the sum of the value added produced by the labor and property inputs in a state. It also represents the sum of the compensation paid to employees, property income, indirect business taxes, capital depreciation, and related liabilities from the production process. One important point to note here is that the labor, property, and land inputs are measured by their physical location in the production process not by the residences of the workers or the owners of the capital and land. For example, the output of a Rhode Island resident who commutes to Massachusetts for his/her work is considered part of the GSP of Massachusetts. On the other hand, a Massachusetts worker who commutes to Connecticut adds to the real GSP of Connecticut. A British firm that operates in Massachusetts contributes to the GSP of the Commonwealth.

The annual values of the Gross State Products for states are derived by adding the GSP originating in all industries (value added) in a state during a calendar year. This concept of "value added" underlies the calculation of the nation's GDP and each state's GSP. Value-added is derived from the market value of gross output less all intermediate inputs from other industries. The U.S. Commerce Department's Bureau of Economic Analysis provides time series data on both nominal and real Gross State Product for each state. Our analyses are based on the Bureau of Economic Analysis' Gross State Product series for states measured either in constant 1996 prices for the 1989-99 period or in 2000 prices for the 2000-2004 period.

The Sources of Real Output Growth in a State: Findings of The Supply GDP Approach

There are a myriad of demographic, labor market, sectoral demand, and technological factors that have a direct influence on the aggregate level of output and the per capita output performance

of a state economy. Knowledge of trends in the values of each of these variables, their contribution to output levels at a point in time, and their contribution to the growth of real output over time is indispensable to efforts to assess the past sources of growth and in formulating future economic policies to stimulate economic growth.

One methodology for identifying the sources of GSP in a state at a point in time and the sources of growth in aggregate or per capita GSP over time is known as the supply GDP model.[3] According to this model, the annual value of the GSP of a state economy can be viewed as the product of four demographic, labor force attachment, labor force utilization, and labor productivity variables. GSP per capita is simply the product of these four variables divided by the size of the state's resident population (P).

Disaggregating the Sources of GSP of a State's Economy

GSP = Pw * L/Pw * E/L * GSP/E

Where, **Pw** = The number of persons 16+ in the state's resident civilian non-institutional population.
L = The annual average number of working-age persons (16+) who either worked or looked for work during the year.
E = The number of working-age persons who were employed on average during the year.
GSP/E = Real output per employee in the state.
GSP/P = Pw/P * L/Pw * E/L * GSP/E
Where, **GSP/P** = Per capita real gross state product.
P = Total resident population of the state.

The first variable in the model (Pw) is a demographic variable representing the age structure of the state's resident population. The GSP per capita of a state during any year will be influenced in part by the share of its resident population that is of working-age (Pw/P). The higher the ratio of Pw/P, the greater is the state's potential GSP since a larger share of the resident population is potentially available for work.

The second variable in the supply GDP model is a measure of the degree of attachment to the labor force by a state's working-age residents, i.e., its civilian labor force participation rate (L/P). The labor force attachment of a state's working-age population also will have an independent influence on its output potential by making more residents available for work and thus capable of producing market output.

While higher rates of labor force participation can raise the levels of real output of a state, labor force participants can only contribute to the real output performance of a state's economy by being employed. The variable E/L is a measure of labor force utilization and is based on the employment experiences of labor force participants during the entire calendar year. This variable measures the fraction of the state's labor force participants who were employed on average during a year. Its value is equivalent to one minus the annual average unemployment rate for the state (E/L = 1- U/L).

The variable GSP/E represents the mean value of output per state resident who was employed during the year; i.e., a measure of labor productivity. The annual output per worker is dependent upon the intensity of employed persons' work experiences during the year and their output per hour (GSP/H). The higher the mean annual hours worked and the higher is output per hour, the greater will be the state's real GSP.

The GSP/E variable is a standard partial labor productivity measure, representing the annual

value of real output (GSP) per worker. The value of this labor productivity variable represents not only the contributions of labor skills and abilities, but also the quantity and quality of the physical capital with which they work, the amount of accompanying energy and material inputs, and the quality of management. Labor productivity improvements are the most desirable way to improve real output per capita since these gains do not come at the expense of either leisure time or home output, and they are critical to raising the real wages and annual earnings of residents in the long-run.

To illustrate the uses of the supply GDP model, let us analyze the growth rates of real GSP and GSP per capita in both Massachusetts and the U.S. between 1989 and 2000. Real GSP for both years is measured in constant 1996 prices.

Table 66:

Trends in Real GSP Per Capita in Massachusetts and the U.S. and Their Underlying Determinants, 1989-2000 (GSP in Constant 1996 Dollars)

MASSACHUSETTS	1989	2000	PERCENT CHANGE
Real GSP (in billions)	193.8	269.3	39.0
Real GSP Per Capita	$32,223	$42,436	31.5
Pw/P	76.8	75.7	-1.4
L/Pw	68.9	67.4	-2.2
E/L	96.0	97.3	1.3
H/E	1,985	2,033	2.4
Y/H	$31.99	$42.03	31.4

UNITED STATES	1989	2000	PERCENT CHANGE
Real GSP (in billions)	6,538.6	9,314.3	42.4
Real GSP Per Capita	26,492	33,097	24.9
Pw/P	75.5	74.5	-1.4
L/Pw	66.4	67.2	1.2
E/L	94.7	96.0	1.4
H/E	2,017	2,058	2.0
Y/H	$27.63	$33.48	21.2

Sources: (i) Geographic Profile of Employment and Unemployment, 1989 and 2000, U.S. Bureau of Labor Statistics; (ii) Bureau of Economic Analysis, U.S. Department of Commerce; (iii) U.S. Census Bureau, Population Division, population estimates by state.

The real GSP of Massachusetts is estimated by the Bureau of Economic Analysis to have increased by nearly $76 billion or 39.0 percent over the 1989-2000 period, representing an annual growth rate of 3.3 percent. Massachusetts' growth rate of aggregate real output lagged modestly behind that of the nation as a whole over the 1990s (39% vs. 42%); however, the rate of growth of real GSP per capita in Massachusetts was slightly higher than that for the entire nation (31.5% vs. 24.9%) due to slower population growth in the state over the 1990s (Table 66).

How did Massachusetts manage to achieve this 31.5% growth in real GSP per capita over the 1989-2000 period? We identified the values of the five variables influencing the level of per capita GPS in 1989 and 2000 and estimated the percent changes in each of these five variables over time.[4] The PW/P variable actually declined modestly by 1.1% between 1989 and 2000 as the under 16 population rose more rapidly than the working-age population. The labor force participation rate of the state also declined by 1.5 percentage points over this time period, representing a 2.2 percent decline. The state's unemployment rate was lower in 2000 than in 1989; thus, the E/L variable rose by 1.3 percent, and mean annual hours of work rose from 1,985 to 2,033, a gain of 2.4%. The main variable underlying the growth of real GSP per capita was labor productivity, i.e., real output per hour of work. It rose by 31.4% between 1989 and 2000, far outstripping the productivity growth rate of the nation (21.2%) over the same 11 year period. Thus, nearly all of the gain in real GSP per capita in Massachusetts was attributable to gains in labor productivity (31%). Massachusetts ranked third highest among the 50 states on the labor productivity measure trailing only Connecticut and New York.

To answer our original questions on the sta-

tistical links between the growth of the working-age population, the civilian labor force, and other key employment, output and labor productivity measures, we conducted a series of correlation tests across states for two time period: 1989-1999 and 2000-2004. The statistical test is admittedly a simple one involving the estimation of Pearson correlation coefficients for pairs of variables and testing for statistical significance. The Pearson correlation coefficient can range in value from +1.00 to -1.00. A +1.00 coefficient would imply perfect, positive correlation between the two variables; i.e., they move up or down together at the exact same rate. A correlation coefficient of 0 would imply no relationship between the movement of the two variables over time.

Findings of our analysis for the two time periods are displayed in Tables 67 and 68. For the 1989-99 period, we observe an extremely high +.965 correlation between the growth rates of the state's working-age population and its civilian labor force. The two variables tended to increase across the state at nearly exactly the same rate over time. The simple correlation between the growth of the working-age population and the changes in civilian labor force participation rates of states was relatively low -.248 and not statistically significant.[5] These findings provide little comfort for our state. Civilian labor force growth is overwhelmingly influenced by growth in the state's working-age population. States with low population growth do not respond by markedly increasing their rate of labor force participation. They are simply left with a slow growing labor force. Findings for the more recent 2000-2004 period confirm both of these results. Civilian labor force growth across states was again overwhelmingly associated with the growth of its working-age population, and participation rates do not adjust upward in response to a more slowly growing population.

Table 67:

Simple Correlations Between Growth Rates in the Working-Age Population, the Resident Civilian Labor Force, and Key Employment, Output, and Labor Productivity Growth Measures Across the 50 States and the District of Columbia, 1989-1999

CORRELATION OF CIVILIAN LABOR FORCE GROWTH RATE WITH GROWTH OF	VALUE OF R	SIG. OF R
Working-age population	.965	.001
Civilian employment (household measures)	.906	.001
Real GSP	.731	.001
Real GSP per worker	.112	Not sig. .05
Correlation of Growth in Working-Age Population With Civilian labor force participation rate	-.248	Not sig. .05

Table 68:

Simple Correlations Between Growth Rates in the Working-Age Population, the Resident Civilian Labor Force, and Key Employment, Output, and Labor Productivity Growth Measures Across the 50 States and the District of Columbia, 2000-2004

CORRELATION OF CIVILIAN LABOR FORCE GROWTH RATE WITH GROWTH OF	VALUE OF R	SIG. OF R
Working-age population	.849	.001
Civilian employment (household measures)	.816	.001
Real GSP	.460	.001
Real GSP per worker	-.086	Not sig. .05
Correlation of Growth in Working-Age Population With Civilian labor force participation rate	-.196	Not sig. .01

During the 1990s and again over the 2000-2004 period, growth of the civilian labor force and the employed resident population of states were highly positively correlated. The value of the correlation coefficient between these two variables was equal to nearly 0.91 for the 1989-99 period, significant at the .001 level. This finding implies that the vast majority of the additions to a state's labor force were absorbed into the ranks of the employed over the decade. A state with slow labor force growth would experience slow employment

growth. Unemployment rates do not significantly adjust downward in a slow growth labor force environment.

Civilian labor force growth also was strongly associated with real output growth of state economies in the 1990s, with a correlation of 0.731, highly significant (.001 level). Over the 2000-2004 period, the correlation between these two variables was also positive and statistically significant but more modest (0.460). States that achieved higher labor force growth also experienced higher real output growth. Lower labor force growth implied lower real output growth for states with its adverse consequences for lower aggregate incomes and consumption.

The empirical evidence for both the 1990s and the most recent 2000-2004 period suggests no significant correlation either positive or negative between the growth of a state's resident labor force and the growth rate of real GSP per worker, a standard measure of labor productivity. During the 1990s, the correlation coefficient between these two variables was modestly positive but not close to statistical significance while it was modestly negative (-0.086) during the 2000-2004 period but again not significant. On the one hand, this finding implies that high labor force growth by itself does not automatically lead to higher productivity growth; thus, lower labor force growth need not hamper labor productivity growth. On the other hand, lower labor force growth does not automatically challenge states to adopt higher rates of technological change or achieve greater rates of physical/human capital investment to produce higher productivity growth than states with easier access to labor force growth.

In the absence of renewed labor force growth, our state will face lower growth rates in real output and employment and accompanying lower growth in aggregate incomes, earnings, and state and local tax receipts. As will be noted in a following monograph, higher labor productivity over the past four years has not led to higher real wages and salaries for the average workers in our state and the degree of inequality in annual earnings and incomes appears to have increased. Strengthening labor force attachment among the existing working-age population, especially among teens from low to middle income families, adults with no post-secondary schooling, low income adults, and disabled adults, can help achieve higher growth in the state's resident labor force, the level of employment, and the level of real output and improve the distribution of earnings and incomes, a clear win, win, win, win solution.

Endnotes

1. According to findings from the Local Area Unemployment Statistics program (LAUS), the mean monthly size of the state's resident labor for the first six months of this year was about 3,300 below its level for the same six month period in 2005.
2. For a review of the views of ZPG and NPG advocates, see the websites of the following organizations: Population Connections and Negative Population Growth. The Federation for American Immigration Reform (FAIR) has advocated stricter controls on immigration to reduce population growth in the nation and to achieve a more assimilated population. For another view on the negative effects of lower population growth among the native born and increased immigration, *See*: Patrick J. Buchanan, *The Death of the West*, St. Martin's Press, New York, 2002.
3. The supply GDP approach was used in prior years by the U.S. Bureau of Labor Statistics to project future output and employment by industry and for the entire economy.
4. For this analysis, we were able to disaggregate the GSP/E variable into its two underlying components: H/E (annual hours of work per employed person) and GSP/H, output per hour of work. Annual work hours among the employed in our state were estimated with the March CPS work experience survey.
5. Our tests of statistical significance are at the .05 level, two-tailed test.

VII. THE PROJECTED OUTLOOK FOR LABOR FORCE GROWTH IN MASSACHUSETTS, 2005-2015

Given the limited labor force growth of the state during the decade of the 1990's and the absence of any labor force growth over the first five years of the current decade, one might well ask what the projected outlook is for labor force growth in the state over the coming decade, 2005-2015.[1] The future growth of the state's resident civilian labor force will be impacted by three sets of factors: the projected increase in the overall size of the state's working age population (16 and older), the changing age/gender/educational attainment composition of the state's working age population, and changes in the labor force participation rates of selected age/gender groups over the 2005 to 2015 period.

To project the future size and age/gender composition of the civilian labor force in Massachusetts, we must first obtain projections of the size and age/gender composition of the state's working-age population (16 and older) over the 2005-2015 period. The U.S. Census Bureau has provided projections of state population growth through 2025.[2] We have used the findings of the Census Bureau's projections of the state's population by gender and single age groups to estimate the number of working-age persons in the following eight age groups both in the aggregate and by gender for the years 2005, 2010, and 2015:

- 16-19
- 20-24
- 25-29
- 30-34
- 35-44
- 45-54
- 55-64
- 65+

The Projected Outlook for Growth in the State's Working-Age Population, 2005-2015

The first key source of potential growth in the state's resident labor force is an increase in the size of the state's working-age population (16 and older). Recent projections by the U.S. Census Bureau of the size and the age and gender composition of the state's working-age population between 2005 and 2015 are displayed in Table 69.[3] In 2005, the number of persons in the working-age population of the state was estimated to be 5.042 million (Table 69). By 2010, the working-age population is projected to rise to 5.192 million, representing a gain of slightly more than 150,000 or 2.9%. Between 2010 and 2015, the working-age population of the state is projected to grow more slowly, rising by only 93,500 or 1.8% over this five-year period.[4] For the entire decade, 2005-2015, the size of the state's resident working-age population is projected to increase by nearly 244,000 or 4.8%. This rate of population growth will be only half as high as that projected for the nation (11%) over the same time period, but would be above that over the past five years. Our state's share of the nation's working-age population will continue to decline over the coming decade. This relative decline will be accompanied by a number of adverse economic and political consequences, including a reduced number of political representatives in the U.S. Congress.

NEW IMMIGRANTS WILL CONTRIBUTE SUBSTANTIALLY TO THE FUTURE GROWTH OF THE STATE'S LABOR FORCE

Growth in the state's working-age population over the coming decade will vary dramatically by age group. The aging of the members of the post–World War II baby boom generation (those born between 1946 and 1964) will lead to high rates of growth in the 55-64 and 65+ year old age cohorts.[5] Their projected population growth rates of 26.9% and 18.8%, respectively,

Table 69:

Projected Size of the Working-Age Resident Population of Massachusetts by Age Group and Gender 2005, 2010, and 2015

AGE GROUP	CENSUS POPULATION PROJECTIONS			ABSOLUTE CHANGE			PERCENT CHANGE		
ALL	2005	2010	2015	2005-2010	2010-2015	2005-2015	2005-2010	2010-2015	2005-2015
16-19	366,622	380,763	348,634	14,141	-32,129	-17988	3.86	-8.44	-4.9
20-24	431,142	474,113	477,596	42,971	3,483	46,454	9.97	0.73	10.7
25-29	412,781	431,272	470,076	18,491	38,804	57,295	4.48	9.00	13.8
30-34	434,213	415,089	429,881	-19,124	14,792	-4,332	-4.40	3.56	-1.0
35-44	1,027,567	923,330	846,105	-104,237	-77,225	-181,462	-10.14	-8.36	-17.6
45-54	965,371	1,024,768	989,385	59,397	-35,383	24,014	6.15	-3.45	2.4
55-64	683,634	792,380	867,690	108,746	75,310	184,056	15.91	9.50	26.9
65+	720,689	750,615	856,505	29,926	105,890	135,816	4.15	14.11	18.8
Total	5,042,019	5,192,330	5,285,872	150,311	93,542	243,853	2.98	1.80	4.8
Men									
16-19	183,655	189,228	172,553	5,573	-16,675	-11,102	3.03	-8.81	-6.0
20-24	215,611	234,861	234,754	19,250	-107	19,143	8.93	-0.05	8.8
25-29	200,831	213,863	231,059	13,032	17,196	30,228	6.49	8.04	15.0
30-34	211,759	200,182	211,410	-11,577	11,228	-349	-5.47	5.61	-0.2
35-44	503,377	448,645	406,965	-54,732	-41,680	-96,412	-10.87	-9.29	-19.2
45-54	469,939	500,064	481,339	30,125	-18,725	11,400	6.41	-3.74	2.4
55-64	325,496	377,526	414,725	52,030	37,199	89,229	15.98	9.85	27.4
65+	305,083	322,643	372,837	17,560	50,194	67,754	5.76	15.56	22.2
Total	2,415,751	2,487,012	2,525,642	71,261	38,630	109,891	2.95	1.55	4.6
Women									
16-19	182,967	191,535	176,081	8,568	-15,454	-6,886	4.68	-8.07	-3.8
20-24	215,531	239,252	242,842	23,721	3,590	27,311	11.01	1.50	12.7
25-29	211,950	217,409	239,017	5,459	21,608	27,067	2.58	9.94	12.8
30-34	222,454	214,907	218,471	-7,547	3,564	-3,983	-3.39	1.66	-1.8
35-44	524,190	474,685	439,140	-49,505	-35,545	-85,050	-9.44	-7.49	-16.2
45-54	495,432	524,704	508,046	29,272	-16,658	12,614	5.91	-3.17	2.6
55-64	358,138	414,854	452,965	56,716	38,111	94,827	15.84	9.19	26.3
65+	415,606	427,972	483,668	12,366	55,696	68,062	2.98	13.01	16.2
Total	2,626,268	2,705,318	2,760,230	79,050	54,912	133,962	3.01	2.03	5.1

over the coming decade will be 4 to 6 times as high as that for the entire working-age population of the state. In the aggregate, the 55+ age cohort is projected to increase in numbers by nearly 320,000 between 2005 and 2015, and they will account for all of the net increase in the resident, working-age population of the state over this decade. While the number of 20-29 year olds also is projected to increase by nearly 104,000 or slightly more than 12 percent over this time period, the growth in their numbers will be offset by declines in the teenaged population and a very steep drop in the 35-44 year old population. The latter group, which includes members of the

baby the "baby bust" generation, is projected to decline by 181,000 or nearly 18 percent over this decade. These are adults who comprise a major segment of the so-called "prime-aged working population" (25-54 year olds). In the aggregate, the prime-aged working population of the state will decline by more than 100,000 over the coming decade. This age group is characterized by the highest rate of labor force participation. These projected changes in the age composition of the state over the coming decade will make the state very dependent for its labor force growth upon older workers (55 and older) and young adults (20-29). To achieve the projected growth in the 20-29 year old population, however, the state will have to reverse the high levels of domestic outmigration of the members of this age group that have taken place over the past three to four years.

Women will comprise a majority (55%) of the projected growth in the working-age population over the 1995-2005 period. While the gender shares of the projected growth in the population of the state will be more even over the 2005-2010 period (53% women, 47% men), women will comprise nearly 60% of the projected growth in the working-age population between 2010 and 2015. Among both men and women, all of the net growth in the resident working-age population of the state between 2005 and 2015 will occur among those 55 and older.

Chart 33:

Projected Changes in the Working-Age Population of Massachusetts Between 2005 and 2015 by Age Group

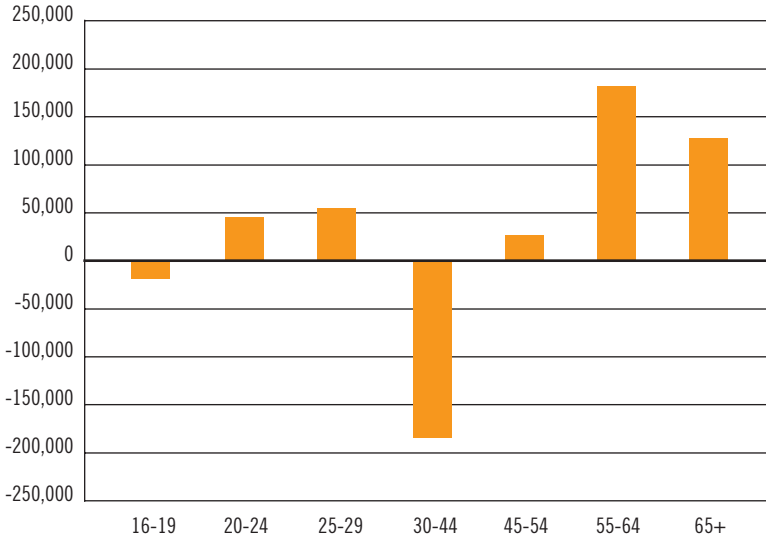


Table 70:

Civilian Labor Force Participation Rates in Massachusetts by Gender and Age Subgroup, 2005 (Annual averages, in percent)

AGE GROUP	ALL	MEN	WOMEN
16+	66.9	72.8	61.5
16-19	47.1	45.8	48.6
20-24	70.4	73.2	67.4
25-29	86.1	89.0	83.2
30-34	78.1	89.5	65.6
35-44	83.2	91.4	76.1
45-54	83.9	88.3	79.6
55-64	66.6	68.3	65.1
65+	17.1	22.1	13.6

Source: January-December 2005 CPS public use files, tabulations by authors.

The Labor Force Participation Rates of Massachusetts Residents in 2005 and the Projected Outlook to 2015

The third key set of variables that drive the projected growth of the resident labor force is the labor force participation behavior of the working age population. Estimates of the annual average, civilian labor force participation rates of Massachusetts residents by age group and gender in 2005 are displayed in Table 70.[6] Similar to the behavior of their national counterparts, the civilian labor force participation rates of Massachusetts residents rise sharply as they move from their teenaged years when only 47.1% were active in the labor force to 83 to 86 percent when they

Table 71:

Civilian Labor Force Participation Rates in Massachusetts and the U.S. by Age Subgroup, 2005 (Annual Averages, in Percent)

AGE GROUP	U.S.	MA	MA – U.S.
16+	66.0	66.9	0.9
16-19	43.7	47.1	3.4
20-24	74.6	70.4	-4.2
25-29	82.4	86.1	3.7
30-34	83.2	78.1	-5.1
35-44	83.8	83.2	-0.6
45-54	81.7	83.9	2.2
55-64	62.9	66.6	3.7
65+	15.1	17.1	2.0

Table 72:

Projected Civilian Labor Force Participation Rates in the U.S. 2005-2014 by Age Group

AGE GROUP	2005	2014	PERCENTAGE POINT CHANGE
16+	66.0	65.6	-0.4
16-19	43.3	39.3	-4.0
20-24	74.8	73.8	-1.0
25-34	83.2	85.4	2.2
35-44	83.6	83.0	-0.6
45-54	81.4	82.3	0.9
55-64	62.7	65.2	2.5
65+	14.9	19.7	4.8

Source: U.S. Bureau of Labor Statistics, web site.

reach their late 20's and their mid to late 30's. Labor force participation rates tend to decline after the mid 40's and drop steeply after age 55 and then again after age 65. Men were more likely to be in the labor force than women except in their teenaged years when women's labor force attachment slightly outpaced that of men. Male teens also faced high rates of unemployment.

A comparison of the 2005 civilian labor force participation rates of the state's working-age residents with those of their U.S. counterparts reveals that Massachusetts residents were modestly more likely to be in the civilian labor force, both overall and in each most but not all groups (Table 71). For the entire working age population (16 and older), the annual average labor force participation rate of Massachusetts residents was 66.9%, exceeding that of their U.S. counterparts by .9 percentage points.

In our first labor force projections scenario for the state for 2005, 2010 and 2015, we have applied the 2004-2005 average civilian labor force participation rates for each age/gender subgroup to their 2005, 2010, and 2015 projected population levels. The Key assumption underlying the labor force projections under scenario one is that these participation rates will remain unchanged over this ten year period, 2005 to 2015. Under the second projections scenario, we adjust the 2004-2005 average labor force participation rates for each age/gender group in Massachusetts for the projected national changes in those labor force participation rates for these same demographic subgroups between 2005 and 2014. The U.S. Bureau of Labor Statistics has projected civilian labor force participation rates for these age groups from 2005 through 2014 (Table 72).

For three of these age groups, including teens and young adults, the Bureau of Labor Statistics has projected modest increases in their participation rates ranging from 0.9 to 2.5 percentage points. The nation's 55-64 year olds are projected to increase their labor force participation rate by 2.5 percentage points, and the elderly (65+) are projected to boost their participation rate by a more sizable 4.8 percentage points. We have projected these participation rates outward to 2015 by assuming that they will not change from their 2014 level.

State Labor Force Projections, 2005-2015. under Two Alternative Scenarios

Given the above findings on the projected number of working age persons in each age and gender group in 2005, 2010, and 2015 and their labor force participation rates in 2005, we can derive projected estimates of the number of civilian labor force participants in each gender/age group in 2010 and 2015. By multiplying the projected number of persons in each age/gender group by their projected labor force participation rate during the same year, we can obtain estimates of the projected number of civilian labor participants in each age/gender group in 2005, 2010 and 2015. Summing these projected labor force estimates across the 16 age/gender subgroups for each year will yield the projected aggregate size of the state's civilian labor force in each year (2005, 2010, 2015).

In deriving our projections of the size and age/gender composition of the state's resident labor force in 2005, 2010 and 2015, we have utilized two different scenarios based upon somewhat different assumptions about the participation behavior of the working age population by age and gender group. Under the first scenario, we have assumed that the civilian labor force participation rates of working-age residents in Massachusetts in each age/gender group will remain unchanged between 2005 and 2015.

The year 2005 civilian labor force in Massachusetts under scenario one was obtained by multiplying the number of persons in each of the 16 age/gender subgroups in the year 2005 by their average 2004-2005 civilian labor force participation rates. The projected sizes of the labor force in 2010 and 2015 were generated by multiplying the number of persons in each age/gender subgroup in each of those two years by these same average labor force participation rates for 2004-2005.

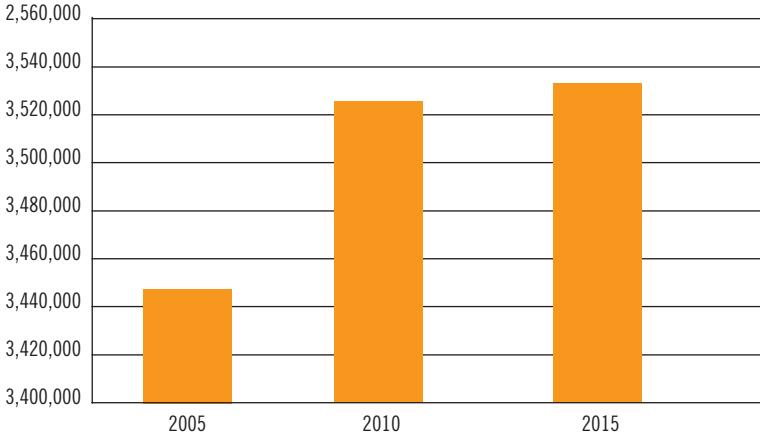
Table 73:

Civilian Labor Force Participation Rates of Massachusetts 2004/2005 Averages, and Projected 2010 and 2015 by Age Group (in percent)

AGE GROUP	2004/2005 AVERAGE	2010	2015	PERCENTAGE POINT CHANGE 2005-2010	PERCENTAGE POINT CHANGE 2010-2015
16+	67.2	67.0	66.8	-0.2	-0.2
16-19	47.5	44.6	42.9	-2.9	-1.7
20-24	73.1	72.0	71.9	-1.1	-0.1
25-29	86.6	88.8	89.3	2.2	0.5
30-34	79.9	81.8	82.5	1.9	0.7
35-44	84.2	83.8	83.6	-0.4	-0.2
45-54	83.7	83.5	84.2	-0.2	0.7
55-64	68.3	69.8	71.2	1.5	1.4
65+	15.9	19.0	21.2	3.1	2.2

Chart 34:

Projected Size of the Civilian Labor Force in Massachusetts, 2005-2015



Under our second projections scenario, we adjusted the 2004-2005 civilian labor force participation rates for each age/gender group in Massachusetts upward (or downward) by the U.S. Bureau of Labor Statistics projections of changes in the national labor force participation rates for these same age groups through the year 2014. Because the national labor force projections provided by the BLS only go through 2014, we assume that the 2014 labor force participation rates will

Table 74:

The Projected Civilian Labor Force in Massachusetts in 2005, 2010 and 2015 Under Two Alternative Scenarios

AGE	SCENARIO ONE			SCENARIO TWO		
ALL	PROJECTION 2005	PROJECTION 2010	PROJECTION 2015	PROJECTION 2005	PROJECTION 2010	PROJECTION 2015
16-19	174,274	181,093	165,858	174,274	170,450	149,863
20-24	314,460	345,653	348,070	314,460	340,473	342,210
25-29	357,273	373,519	407,005	357,273	382,551	419,418
30-34	345,234	329,583	342,139	345,234	337,323	353,245
35-44	867,828	779,286	713,532	867,828	775,196	707,770
45-54	807,593	857,396	827,655	807,593	854,018	831,452
55-64	465,969	540,108	591,531	465,969	552,629	616,897
65+	116,066	121,301	138,810	116,066	143,931	202,252
Total	3,448,699	3,527,940	3,534,600	3,448,699	3,556,571	3,623,107
Men						
16-19	81,410	83,881	76,489	81,410	77,068	66,481
20-24	164,423	179,103	179,021	164,423	174,640	172,918
25-29	179,993	191,672	207,084	179,993	197,660	214,478
30-34	189,851	179,472	189,538	189,851	185,277	197,149
35-44	460,766	410,667	372,515	460,766	407,526	367,632
45-54	415,638	442,282	425,721	415,638	436,281	421,389
55-64	233,409	270,720	297,395	233,409	269,964	297,395
65+	64,067	67,755	78,295	64,067	78,402	99,174
Total	1,789,557	1,825,551	1,826,058	1,789,557	1,826,821	1,836,615
Women						
16-19	92,864	97,213	89,369	92,864	93,382	83,382
20-24	150,037	166,550	169,049	150,037	165,832	169,292
25-29	177,281	181,847	199,920	177,281	184,891	204,940
30-34	155,383	150,112	152,601	155,383	152,046	156,096
35-44	407,063	368,619	341,017	407,063	367,670	340,138
45-54	391,955	415,113	401,934	391,955	417,737	410,063
55-64	232,560	269,389	294,136	232,560	282,664	319,502
65+	51,999	53,546	60,515	51,999	65,529	103,077
Total	1,659,142	1,702,389	1,708,542	1,659,142	1,729,751	1,786,492

remain the same as those for the year 2015.

The projected civilian labor force participation rates for each age subgroup in Massachusetts in 2010 and 2015 under our second scenario are displayed in Table 73. For some of these age groups, the participation rates in 2010 and 2015 are modestly above those in 2005 with the largest gains projected for older persons(55 and older) and 25-29 year olds. Other age groups including teenagers, 20-24 year olds and 35-54 year olds, are projected by the U.S. Bureau of Labor Statistics to experience modestly declining participation rates as we move through the coming decade.

The Projected Growth of the Size and Changing Age Composition of the Massachusetts Civilian Labor Force between 2005 and 2015: Scenario One

Findings of our first set of labor force projections for the state for the 2005-2015 time period are displayed in Tables 74 and 75 and Charts 34 through 36.[7] Over this ten-year period, the overall size of the resident labor force of Massachusetts is projected to rise by only 85,900 or 2.5 percent, with nearly all of this increase taking place between 2005 and 2010. Over the first five year period (2005-2010), the resident labor force is projected to grow from 3.449 million to 3.528 million, a gain of slightly more than 79,000 or 2.3 percent. However, between 2010 and 2015, the resident labor force would grow by only 6,660 or .2 percent. The very limited projected growth of the state's labor force over this latter five year period is attributable to a combination of low overall growth in the working- age population combined with a movement in the population toward older age groups (55 to 64) and (65 and older) whose labor force attachment is below average.

Between 2005 and 2015, women will comprise a slight majority (57 percent) of the projected increase in the state's resident labor force (Table 75). Actually, this development would represent a marked improvement in the male share of labor force growth that took place over the decade of the 1990's. Between 1990 and 2000, men accounted for only 3 percent of the state's labor force growth, the lowest share ever recorded in the sixty year period (1940-2000) for which such data are available.[8] Between 2010 and 2015, however, the male labor force will essentially be stagnant under scenario one, with a projected increase in the male labor force of only 507 persons slightly under 0.03 percent (Table 75).

The projected growth in the state's resident labor force over the 2005-2010 time period will be concentrated among persons at the upper end of the age distribution (Table 75 and Chart 34). All of the net increase in the projected labor force between 2005-2010 will take place among persons 45 and older whose ranks will increase by nearly 130,000 while the overall resident labor

Table 75:

Projected Change in the Size and Age/Gender Composition of the Civilian Labor Force in Massachusetts, Scenario One

	CHANGE, 2005-2010		CHANGE, 2010-2015	
AGE	ABSOLUTE	PERCENT	ABSOLUTE	PERCENT
16-19	6,819	3.9	-15,235	-8.4
20-24	31,193	9.9	2,418	0.7
25-29	16,246	4.5	33,485	9.0
30-34	-15,651	-4.5	12,556	3.8
35-44	-88,542	-10.2	-65,754	-8.4
45-54	49,802	6.2	-29,740	-3.5
55-64	74,139	15.9	51,423	9.5
65+	5,235	4.5	17,509	14.4
Total	79,241	2.3	6,661	0.2
Men				
16-19	2,470	3.0	-7,392	-8.8
20-24	14,680	8.9	-82	0.0
25-29	11,680	6.5	15,412	8.0
30-34	-10,379	-5.5	10,066	5.6
35-44	-50,099	-10.9	-38,152	-9.3
45-54	26,644	6.4	-16,561	-3.7
55-64	37,310	16.0	26,675	9.9
65+	3,688	5.8	10,541	15.6
Total	35,994	2.0	507	0.0
Women				
16-19	4,349	4.7	-7,844	-8.1
20-24	16,513	11.0	2,499	1.5
25-29	4,566	2.6	18,074	9.9
30-34	-5,272	-3.4	2,489	1.7
35-44	-38,443	-9.4	-27,603	-7.5
45-54	23,158	5.9	-13,179	-3.2
55-64	36,829	15.8	24,748	9.2
65+	1,547	3.0	6,968	13.0
Total	43,247	2.6	6,153	0.4

Chart 35:

Absolute Change in the Projected Civilian Labor Force in Massachusetts by Age Group, 2005-2010, Scenario One

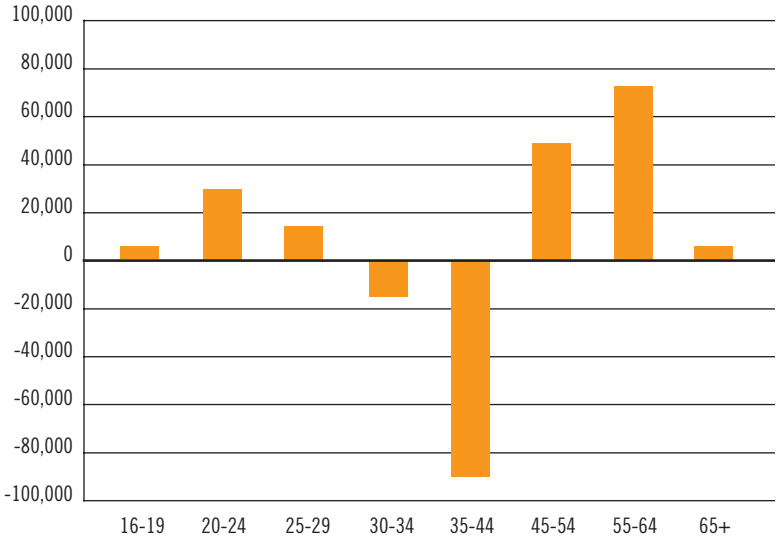
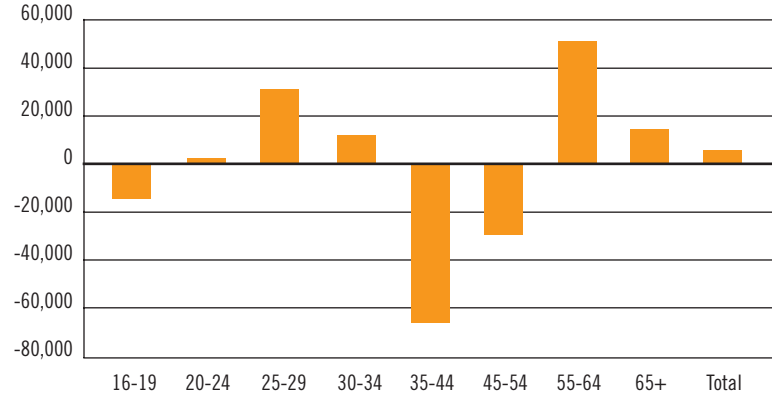


Chart 36:

Absolute Change in the Projected Civilian Labor Force in Massachusetts by Age Group, 2010-2015, Scenario One



force will rise by only 79,000. While the number of 20-29 year olds in the labor force is also projected to increase, provided high recent out-migration levels among young adults are reduced, their gains will be more than offset by a steep decline (-104,000) in the number of 30-44 year olds in the labor force, reflecting the movement of the baby bust generation into this age group with their numbers further reduced by recent out-migration. The age patterns of the changes in the labor force are very similar among both men and women over the 2005-2010 period (Table 75). Among both gender groups, all of the net increase in the labor force will be among persons 45 and older.

Between 2010 and 2015, the state's overall labor force is projected to rise by only 6,660. Yet, the number of labor force participants ages 55 and older is projected to grow by nearly 69,000 over the same time period (Chart 36). The graying of the Massachusetts labor force will accelerate over this five year period. The gains in the number of 20-34 year olds will be overwhelmingly offset by steep declines in the number of 35-54 year olds in the state's labor force whose numbers are projected to drop by 95,500 (Table 75).

The Projected Size and Age Composition of the Massachusetts Civilian Labor Force between 2005 and 2015: Scenario Two

The projected growth in the labor force of the state under our second scenario is more optimistic than the first scenario due to the assumption of slightly higher labor force participation rates for most subgroups of the working age population.[9] Under our second projections scenario, the state's resident labor force is expected to increase from 3.449 million to 3.604 million between 2005 and 2015, representing a gain of 155,060 or 4.5%, with nearly all of this increase taking place between 2005 and 2010 (Table 76). Over the first five year period (2005-2010), the labor force is projected to grow from 3.449 million to 3.557 million, a gain of 107,873 or 3.1 percent. However, between 2010 and 2015, the resident labor force will only grow by 66,535 or under 2 percent. Similar to our first set of projections, the slower projected growth of the state's labor force over this latter five year

period is attributable to a combination of low overall growth in the working- age population combined with a movement in the population toward older age groups (55 to 64 and 65 and older).

Between 2005 and 2015, women will comprise the vast majority (70 percent) of the projected increase in the state's resident labor force. Between 2010 and 2015, the state's male labor force will experience only very modest growth under scenario two, with a projected increase in the male labor force of 9,794 or 0.5 percent.

The age composition of labor force growth over the 2005-2010 time period will be geared toward the upper end of the age distribution (Table 76). All of the net increase in the projected labor force between 2005-2010 will take place among those 45 and older, whose ranks will increase by more than 161,000 while the overall resident labor force will rise by only 107,873. Although the number of 20-29 year olds in the labor force will also increase, their gains will be more than offset by a steep decline (-100,543) in the number of 30-44 year olds in the labor force. The age composition of the changes in the labor force are very similar among both men and women over the 2005-2010 period. Among both gender groups, all of the net increase in the labor force will be among persons 45 and older. (Chart 37).

Between 2010 and 2015, the state's overall labor force is projected to rise by a more modest 47,188 (Table 76). However, the number of labor force participants ages 55 and older is projected to grow by slightly over 103,000 over the same time period (Chart 38). The gains in the number of 20-34 year olds will be more than fully offset by declines in the number of 35-54 year olds in the state's labor force, especially 35-44 year olds whose ranks are projected to decline by 67,426.

Table 76:

Projected Change in the Size and Age/Gender Composition of the Civilian Labor Force in Massachusetts, Scenario Two

AGE	CHANGE 2005-2010		CHANGE 2010-2015	
TOTAL	ABSOLUTE	PERCENT	ABSOLUTE	PERCENT
16-19	-3,824	-2.2	-20,587	-12.1
20-24	26,013	8.3	1,737	0.5
25-29	25,278	7.1	36,867	9.6
30-34	-7,911	-2.3	15,923	4.7
35-44	-92,632	-10.7	-67,426	-8.7
45-54	46,425	5.7	-22,566	-2.6
55-64	86,659	18.6	64,268	11.6
65+	27,865	24.0	38,974	27.1
Total	107,873	3.1	47,188	1.3
Men				
16-19	-4,342	-5.3	-10,588	-13.7
20-24	10,218	6.2	-1,723	-1.0
25-29	17,668	9.8	16,817	8.5
30-34	-4,574	-2.4	11,872	6.4
35-44	-53,239	-11.6	-39,895	-9.8
45-54	20,643	5.0	-14,893	-3.4
55-64	36,555	15.7	27,430	10.2
65+	14,335	22.4	20,772	26.5
Total	37,263	2.1	9,794	0.5
Women				
16-19	518	0.6	-10,000	-10.7
20-24	15,795	10.5	3,460	2.1
25-29	7,610	4.3	20,049	10.8
30-34	-3,337	-2.1	4,051	2.7
35-44	-39,393	-9.7	-27,532	-7.5
45-54	25,782	6.6	-7,674	-1.8
55-64	50,104	21.5	36,838	13.0
65+	13,530	26.0	18,201	27.8
Total	70,609	4.3	37,395	2.2

Comparisons of Projected Growth in the State's Resident Labor Force Under the Two Scenarios

The projected outlook for labor force growth in Massachusetts under the two scenarios differs somewhat. Under scenario one, which assumes

Chart 37:

Absolute Change in the Projected Civilian Labor Force in Massachusetts by Age Group, 2005-2010, Scenario Two

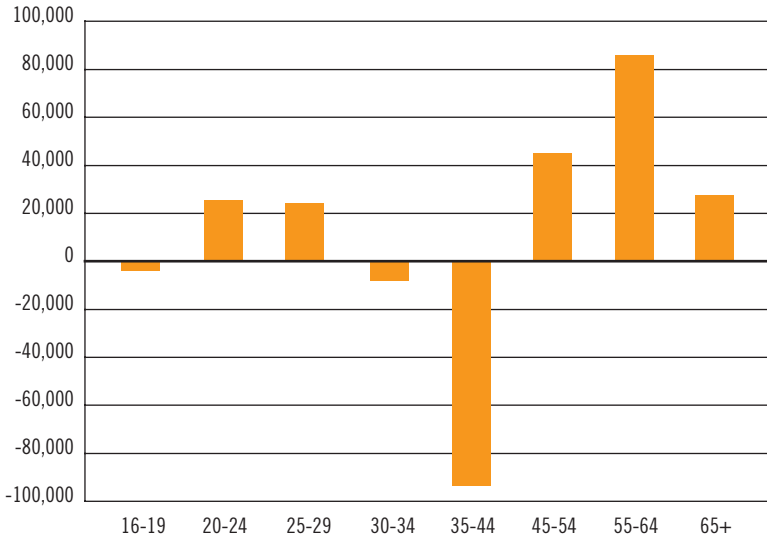
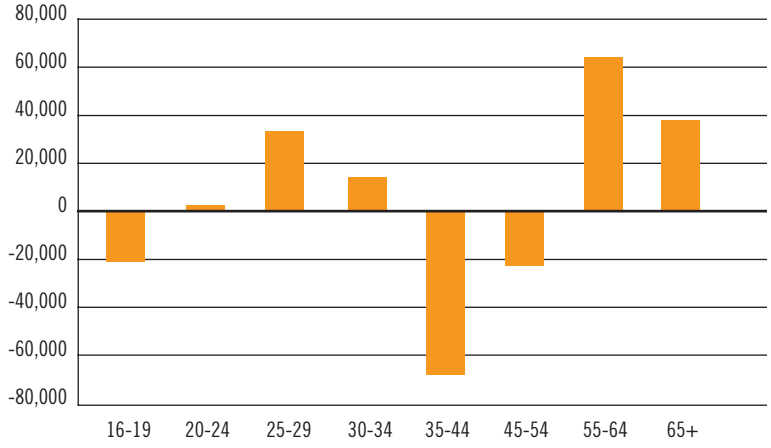


Chart 38:

Absolute Change in the Projected Civilian Labor Force in Massachusetts by Age Group, 2010-2015, Scenario Two



no changes in the existing age/gender pattern of civilian labor force participation rates, the state's civilian labor force will rise by just under 86,000 or 2.5%, a rate of growth only slightly higher that that posted during the 1990's decade but an improvement over the zero growth in the resident labor force over the past five years (Table 77). Under scenario two, which adjusts participation rates for projected age/gender changes at the national level, the labor force of the state will rise by 155,000 or 4.5%, nearly twice the projected rate of growth under scenario one.

Under both scenarios, adults 45 and older will generate all of the net increase in the state's civilian labor force. The graying of the baby boomers will substantially increase the number of Massachusetts adults in the 50 to 69 age group over the coming decade.[10] The projected growth in the 45 and older labor force under scenario one was equal to 168,400. This age group will account for 196% of the increase in the state's labor force between 2005 and 2015. The number of labor force participants under age 45 will decline by 82,000 over the decade.

Under scenario two, the older work force is projected to grow even more strongly primarily due to the BLS assumptions that the participation rates of older persons, specially those 55 and older, will rise over the decade. Of the 69,000 additional labor force participants generated by scenario two, all (73,000) will come from the ranks of those 45 and older. There will be 155,000 more persons in the state's resident labor force in 2015 under scenario two, of whom 241,600 will be 45 and older. Again, all of the net increase in the state's labor force over the decade will be attributable to those persons 45 and older. The median age of the labor force in 2015 will be just under 42 years old up from 38.5 years in 2010. This higher projected rate of labor force growth only will take place if employers are able to absorb the higher numbers of older labor force participants.

Two additional demographic factors need to be considered when assessing these labor force

projections for the Commonwealth. The state population projections of the U.S. Census Bureau for 2005-2015 assume some moderation in the high levels of domestic out-migration that the state has experienced in recent years 2002-2005. If domestic out-migration does not begin to moderate, the working-age population of the state will fall below projected levels and the resident labor force also will not reach the projected levels. As noted earlier, many of the adults who migrated out of the state in recent years were strongly attached to the labor force. The departure contributed to the decline in the labor force from 2002-2005. Second, the population projections for Massachusetts for the 2005-2015 period assume that net international migration will account for all the net increase in the state's population between 2005 and 2010 and between 2010 and 2015.[11] Our analysis of the Census Bureau projections indicate that net international migration (immigrants into Massachusetts – emigrants out of the state) will be 171,316 overt he 2006-2010 period, accounting for all of the projected growth in the state's entire resident population over this entire period. New immigrant arrivals are much more likely to be of working-age than the native born and, thus, will contribute even more substantially to the growth of the resident labor force of the state. The ability of the state to absorb these new immigrants into the paid labor force will be critical to determining the labor force growth potential of the Commonwealth in the coming decade. A potentially troublesome issue, however, is the rising share of new immigrants into the state who are undocumented workers, contributing to a growing black market for labor in the state.[12]

IF DOMESTIC OUT-MIGRATION DOES NOT BEGIN TO MODERATE, THE STATE'S LABOR FORCE WILL NOT REACH ITS PROJECTED GROWTH

Table 77:

Projected Changes in the Size and Age Composition of the Civilian Labor Force in Massachusetts (16 and older), 2005 to 2015 Under Two Alternative Scenarios

	2005	2015	ABSOLUTE CHANGE	PERCENT CHANGE
Scenario One				
Total 16 +	3,448,699	3,534,600	85,901	2.5
45 and Older	1,389,628	1,557,996	168,368	12.1
Change due to 45 and Older (in %)			196.0	
Scenario Two				
Total 16 +	3,448,699	3,603,760	155,061	4.5
45 and Older	1,389,628	1,631,254	241,625	17.4
Change due to 45 and Older (in %)			155.8	

Endnotes

1. Between 1990 and 2000, according to the findings of the decennial Censuses, the Massachusetts civilian labor force grew by only 2%, the fourth lowest rate of growth among the 50 states. See: Andrew Sum, Ishwar Khatiwada, Nathan Pond et. al., *The Absent Male Worker and the Limited Growth in New England's Male Labor Force in the 1990's*, Report Prepared by the Center for Labor Market studies for the New England Regional Office of the Employment and Training Administration, Boston, 2003.

2. The U.S. Census Bureau's state population projections are based on a cohort-component methodology which relies on a set of assumptions about the various components of population change (births, deaths, net domestic migration, and net international migration) to project the future size of the population by age group and gender. See: U.S. Census Bureau, *Interim Projections of the U.S. Population by Age, Sex, Race, and Hispanic Origin*, Washington, D.C., March 2004.

3. The population estimates pertain to the resident population and include persons living in institutions (jails, prisons, nursing homes, mental health institutions) and those serving in the nation's armed forces that are based here in Massachusetts. They will, thus, be somewhat larger than the civilian non-institutional population of working age adults.

4. Part of the projected slowing of the population growth after 2010 is attributable to an assumption of a rising rate of net domestic out-migration after 2010. Our state's population growth will be dependent on the ability to reduce the high levels of domestic out-migration that have taken place in recent years.

5. There were 75 million Americans born between 1946 and 1964. The last members of the baby boom generation, those born in 1964, will not turn 55 until 2019. For the timing of the baby boom cohort and their impact on American life, *See*: Landon Y. Jones, *Great Expectations: America and the Baby Boom Generation*, Coward, McCann, and Geoghegan, New York, 1980.

6. These estimates are based on the monthly CPS household surveys for calendar year 2005.

7. It should be noted that the absolute size of the state's resident civilian labor force based on the projections methodology in 2005 is 3.449 million. This estimate is based on applying the 2004-2005 civilian labor force participation rates for each age/gender subgroup based on the CPS surveys to the 2005 projected resident population of the state by age and gender subgroup. As noted earlier, however, the resident population includes inmates of institutions and members of the armed forces. Hence, it exceeds the civilian, non-institutional population of the state used in deriving the LAUS based labor force estimates. Our projected 2005 labor force will exceed the LAUS estimated labor force by somewhere between 50,000 and 60,000. The key to this exercise, however, is not the level of the civilian labor force in the base year but the projected growth in its size between 2005-2015.

8. *See*: Andrew Sum, Ishwar Khatiwada, Nathan Pond, et.al., *The Absent Male Worker and the Limited Growth in New England's Labor Force in the 1990's*, Center for Labor Market Studies at Northeastern University, report prepared for the New England Regional Office of the U.S. Department of Labor's Employment and Training Administration, Boston, 2003.

9. Teenagers (16-19) are projected to experience a decline in their rate of labor force attachment over the decade.

10. The post-World War II baby boomers will be 51 to 69 years old in the year 2015

11. See: U.S. Census Bureau Population Projections Branch, "Interim Population Projections for States by Age and Sex: 2004 to 2030 Methodology Summary", U.S. Census Bureau, April 2005.

12. See: Paul E. Harrington and Andre Sum, "As Jobs Go Off the Books, Immigrants Edge Out Some Native Born Workers", in *CommonWealth*, Volume II, Number 2, Winter 2006, pp. 83-90.

VIII. SUMMARY OF KEY FINDINGS

Summary of Key Findings and an Assessment of Their Public Policy Implications

This research report has tracked Massachusetts labor force developments over both the past few decades (1970-2000) and the most recent five years (2000-2005). The influence of demographic developments and changing labor force behaviors of key subgroups of the working-age population on the growth of the labor force were identified. Projections of the growth of the state resident labor force over the 2005-2015 period were made under several scenarios, and the economic and labor market consequences of recent and future labor force growth were discussed. A summary of key research findings and their implications for future economic development, education, housing, and workforce development policies are assessed.

(i) The growth of the Massachusetts resident labor force slowed considerably in the 1990s despite high levels of payroll job growth from 1992 to 2000 and record low unemployment rates at the end of the economic boom in 1990 and 2000.[1] In-commuters from neighboring states helped fill a number of these newly-created payroll jobs. According to the findings of the decennial censuses, the Massachusetts labor force increased by only two percent between 1990 and 2000, far below the national growth rate of 15% over the same time period. In contrast, the state's labor force had grown by 15% in the 1980s and by 18% in the 1970s, fueled by the movement of many of the baby boomers into their young adult years and high increases in the labor force participation rates of women.

(ii) Over the past five years (2000-2005), based on the findings of the Local Area Unemployment Statistics (LAUS) program, the resident labor force of Massachusetts has experienced no growth whatsoever. Increases in the labor force between 2000 and 2002 were exactly offset by declines over the past three years. Massachusetts was the only state in the nation to have experienced three consecutive years of labor force decline, a drop of nearly 60,000, and the state ranked last among the 50 states in its growth rate over the 2002-2005 period. During the first six months of 2006, the size of the state's average monthly labor force was modestly below that of the same time period in the prior year. The state is, thus, on the verge of experiencing a fourth consecutive year of labor force decline. This development would be historically unprecedented for the post-World War II era.

MASSACHUSETTS WAS THE ONLY STATE IN THE NATION TO HAVE EXPERIENCED THREE CONSECUTIVE YEARS OF LABOR FORCE DECLINE.

(iii) The stagnation of the state's labor force over the past five years is a consequence of a combination of demographic developments and changes in the labor force participation behavior of state residents. The state has experienced very little growth in the size of its working-age population since 2000 due in large part to high levels of domestic out-migration among relatively young working-age adults with strong attachment to the labor force. In addition, there has been a modest decline in the overall labor force participation rate of the state since 2000, with steeper declines taking place in the labor force attachment of males, teens, and young adults with no post-secondary schooling.

(iv) The overall resident population of Massachusetts is estimated by the U.S. Census Bureau to have grown by only 0.6 percent between July 2000 and July 2005, the third lowest rate of growth among the 50 states. Over the past two years, the state's resident population declined modestly, the only state in the nation with back-to-back annual reductions in its resident population. The 18 and older population increased at a slightly higher rate (1.9%) over the 2000-2005 period, but the state ranked last among the 50 states on this population growth measure. The number of state residents under age 18 declined between 2000 and 2005, reflecting a lower number of births and out-migration of children from the state.

MASSACHUSETTS LED THE NATION ON MOST MEASURES OF EDUCATIONAL ATTAINMENT

(v) The low rate of population growth of the state over the past five years was substantially influenced by high levels of domestic out-migration. Between July 2000 and July 2005, the number of out-migrants to other states exceeded the number of in-migrants from other states by 233,000. Net out-migration from the state has been in the -49,000 to -62,000 range over the past three years. Most of the net out-migration was among prime-aged adults (20-54 years old), including a large number of adults with at least some post-secondary schooling. The out-migrants from the state were more strongly attached to the labor force than were in-migrants especially among Bachelor degree holders. These high levels of out-migration sharply reduced the size of the state's resident labor force. Out-migration of families with children under 16 years of age also will reduce the future size of the state's young adult population, with its negative consequences for future labor force growth.

(vi) The state has become highly dependent on new flows of foreign immigrants to achieve both population and labor force growth. During both the decade of the 1990s and the most recent five year period, new foreign immigrants generated all of the net growth in the state's population and the resident labor force. In the absence of a major influx of new immigrants, in the past five years, especially males with their very strong labor force attachment the state's labor force might have declined precipitously.[2] There are, however, several downsides to the increased reliance on new immigrant workers. They contain an above average share of workers without a high school education, a relatively high share of new immigrant adults have limited English-speaking proficiencies, and an increasing share of new immigrant workers are undocumented. The employment of illegal immigrants has increased the size of the informal labor market, including both off the books workers and independent contracts and reduced basic health insurance and pension coverage rates among Massachusetts workers.

(vii) Our analysis of the educational characteristics of the working-age population and the civilian labor force in Massachusetts during 2003 revealed that Massachusetts typically led the nation on most measures of educational attainment. Massachusetts ranked third highest among the 50 states with respect to the share of its working-age population with some post-secondary schooling (58%), and it ranked first with respect to the share of its population with a Bachelor's or higher academic degree. Nearly 1 of every 3 members of the working-age population had a Bachelor's degree in 2003. On each of the three educational measures for the labor force (percent with some post-secondary schooling, percent with a Bachelor's

or higher degree, percent with a Master's or higher degree), Massachusetts ranked first among the 50 states in 2003.

(viii) The overall labor force participation rate of Massachusetts' working-age adults increased steadily from 1970 through the late 1980s, but peaked in 1989 at just under 69 percent. The annual average participation rate of the state has declined by two percentage points between 1989 and 2005 while that of the U.S. was basically unchanged over the same 20 year period.[3] Massachusetts' ranking among the 50 states declined from 19th highest in 1989 to only 32nd in 2000 and 30th place in 2005. If Massachusetts had matched the annual average participation rate of the top five states in 2005, there would have been 305,000 more residents actively participating in the state's labor force during 2005, an increase of nearly 10 percent in the state's labor force.

(ix) The decline in the overall participation rate of the state over the past two decades was entirely attributable to the participation behavior of men. Between 1978 and 2005, the participation rate of Massachusetts working-age males fell by nearly 7 percentage points versus a less than 5 percentage point decline among U.S. males over the same time period. The declines in labor force attachment among males were particularly severe in the 1990s when the state's labor markets were performing quite strongly, especially from 1994 onward. Drops in male participation occurred among all age groups except those 65 and older and were particularly large among both young men (16-24) and middle aged men (45-64) with no post-secondary schooling. These declines in participation among men have had adverse consequences for family formation, the incomes of families with children, the income distribution, the criminal justice system, the number of men supported by income transfer programs, especially disability programs, and the level of federal and state tax receipts.

(x) The labor force participation rates of women in Massachusetts had risen sharply and continuously from 1960 to 1990, increasing from 38% to 60%. Since then, the labor force participation rate of women in the state has been fairly stable, rising by only 0.5 percentage points between 1989 and 2005, a statistically insignificant change. Women continued to generate a very high share (97%) of state labor force growth in the 1990s due to a rise in the number of women in the working-age population. The state's ranking among all 50 states with respect to the participation rate of women has declined considerably over time. At the time of the 1970 Census, the state ranked 8th highest on this measure, by the late 1970s, the state' rank declined to 15th, and would fall to 30th in 2000. Massachusetts was no longer a leader in the degree of labor force attachment among its women. In 2005, if the participation rate of Massachusetts women had matched that of their peers in the top five performing states, there would have been an additional 163,000 women in the state's labor force.

(xi) The labor force participation rates of Massachusetts working-age adults vary quite widely across educational subgroups. In 2005 these rates ranged from slightly under 42 percent among those lacking a high school diploma/GED to 64 percent for high school graduates and to highs of nearly 78% for Bachelor degree holders and 81% for those with Master's or higher degrees. While Massachusetts was a national leader in the educational attainment of its labor force, it was far from being a national leader in the participation rates of any of its educational subgroups, except those with a Master's or higher degree, who ranked 14th highest among the 50

states. The participation rates of the other four educational groups fell in the bottom half of the distribution for all 50 states with none of these four groups ranking above 32nd place. If the 2005 labor force participation rates of each educational subgroup in Massachusetts had matched the average of the top five performing states in each educational group, there would have been an additional 396,000 additional residents active in the labor force, including 206,000 working-age persons with no more schooling beyond high school and 90,000 adults with a Bachelor's or higher degree. These increases in the labor force attachment of less educated adults and high school students and dropouts would have helped raise the incomes of many poor/near poor families, reduced reliance of families on cash transfer incomes from government, and helped lower the high and rising degree of family income inequality.

THE DECLINE IN THE LABOR FORCE PARTICIPATION RATE WAS ENTIRELY A RESULT OF THE BEHAVIOR OF MEN

(xii) Findings from cross state analyses of the links between growth in the working-age population and labor force growth over the 1990s decade and between 2000 and 2004 revealed very strong positive associations between these two variables (a correlation of 0.96 for the 1990s). Labor force growth was overwhelmingly dominated by growth of the resident working-age population across states over both time periods. States with slow growing populations did not respond by increasing their rate of labor force participation.[4] The growth rate of a state's resident labor force was strongly, positively correlated with the growth of its employed population and its real output level (GSP). The higher numbers of labor force entrants were largely absorbed into the ranks of the employed and increased the aggregate level of output in the state. States with slow growing labor forces experienced less employment growth and less real output growth. There was no significant correlation between the growth rate of a state's labor force or its employed population and the rate of growth of its labor productivity. Massachusetts experienced a very high rate of labor productivity growth in the 1990s achieving the third highest level of labor productivity in 1999, but productivity growth in the state appears to have slowed in the first four years of the current decade.

(xii) Labor underutilization problems in the state have risen sharply since the end of the economic boom in early 2001. Not only was the official number of unemployed persons in 2005 markedly higher (nearly 90% higher) than in 2000, but there also was a substantial increase in the number of underemployed persons and the labor force reserve. The overall pool of underutilized labor in 2005 was estimated at 334,000 accounting for nearly 1 of every 10 members of the adjusted labor force versus only a 6 percent underutilization rate in 2000. The labor underutilization rates in the state in 2005 varied quite widely by educational attainment, ranging from lows of 3.6% for adults with a Master's or higher degree and 7% for those with a Bachelor's degree to a high of 22% for high school dropouts.

(xiv) Using state population projections from the U.S. Census Bureau for the 2005-2015 time period and several sets of assumptions about the future time path of labor force participation rates by age group and gender for Massachusetts residents, we projected the future size and age/ gender composition of the state resident labor force in 2010 and 2015. Under the first scenario, which is based on no change in existing participation behavior, the Massachusetts resident labor force

would rise by approximately 86,000 or 2.5% between 2005 and 2015. Persons 45 and older in the labor force would rise by over 168,000 with the bulk of the projected increase coming from persons 55 and older. Under scenario two, which adjusts the 2005 participation rates for each age/gender group by the U.S. Bureau of Labor Statistics' projected changes in those rates over the 2005-2014 period, the state's labor force would grow more rapidly by 156,000 or 4.5%. This would represent a doubling of the state's labor force experience in the 1990s. Again, all of the projected net growth in the state's civilian labor over the decade will be generated by persons 55 and older. This higher rate of labor force growth would only be possible through a major reduction in the recent levels of out-migration from the state and strengthened labor force participation rates among the state's 45 and older population.

(xv) There are a wide array of demographic subgroups in Massachusetts whose labor force attachment should be strengthened over the remainder of this decade. Among these groups are teens and young adults (20-24) with no post-secondary education. The labor force participation rates of the state's teens, especially males, have fallen dramatically over the past 25 years. The state was once a leader in the labor force attachment of its teenaged population, ranking in the top ten states in the late 1970s and 1980s. In recent years, the state's ranking has deteriorated considerably, falling in the middle of the distribution for all teens, only 34th for high school graduates not enrolled in college, and fourth lowest for teenaged high school dropouts. Access of teens to jobs varies markedly by race-ethnic group and family income group, with large gaps in employment rates between Blacks/Hispanics and White, non-Hispanic youth and between low income teens and their more affluent peers across the state. Boosting the employment rates of high school teens, especially males, minority, and low income teens, could help achieve a number of desirable educational, labor market, and social goals, including school retention, improved career decision making, a smoother transition to the labor market upon graduation, and a larger and more experienced resident labor force.

(xvi) Future anti-poverty policies, welfare reform policies, and disability policies and programs need to be more closely aligned with state and local workforce development programs. A high fraction of the heads of poor/near poor families and the adult disabled in our state are not actively participating in the labor force. Massachusetts had the 3rd lowest rate of labor force participation for poor/near poor householders among the 50 states in 2004, and the state ranked only 36th among the 50 states on the labor force participation rate of its adult (16-74 year old) disabled population. Strengthening the labor force attachment of these poor/near poor householders and the disabled could help achieve a number of desirable economic and social goals, including a larger labor force, a higher level of employment, a reduction in the number of poor/near poor families, an increase in the earnings and incomes of the disabled and the poor, higher state and federal tax receipts, and lower cash and in-kind transfer payments.

ALL OF THE GROWTH IN THE STATE'S LABOR FORCE OVER THE NEXT DECADE WILL BE GENERATED BY PERSONS 55 AND OLDER

(xvii) There is a clear need to more closely integrate state and local housing policies with economic development and workforce develop-

ment policies. High costs of housing, especially homeownership costs for first time home buyers, do seem to contribute to the high levels of out-migration of younger, well-educated families and discourage in-migration from other states. The out-migration of young adults with strong labor force attachment reduces both the current size of the resident labor force and the future labor force. Higher housing costs also contribute to the higher cost of labor in Massachusetts, raising unit labor costs in the private sector.[5] In a recent editorial, *The Boston Globe* noted that "Unaffordable housing puts the Boston area at a competitive disadvantage" we strongly concur.[6]

(xviii) There is a need to increase our existing knowledge base on the effectiveness of adult basic education programs, community college programs, WIA-funded employment and training programs for out-of-school youth, low income adults, and dislocated workers, DTA employment programs for TANF recipients, and vocational rehabilitation programs in strengthening both the labor force attachment and employability of program participants. More rigorous impact evaluations, using both carefully selected comparison groups and control groups, need to be conducted in each of these areas. The Commonwealth Corporation has undertaken a number of initiatives in this area, but other workforce development agencies need to be active participants in the evaluation realm with sharing of findings with all workforce agencies across the state.

(xix) Given the critical importance of the quantity and quality of the state's work force for economic growth and development and future employment and earnings growth, we strongly recommend that the state prepare an Annual Workforce Development Report that would review developments in state labor markets, including labor force, employment, and unemployment developments, changes in labor underutilization, changes in the weekly wages and annual earnings of Massachusetts workers, and employment and training program initiatives to boost the employability and earnings of key subgroups of the working-age population. This report would be prepared by an independent outside panel of labor experts with the active cooperation of state labor market information, educational, and workforce development agencies.

Endnotes

1. An increase in the number of in-commuters from surround states, especially New Hampshire and Rhode Island, helped facilitate the greater growth in payroll employment during the mid to late 1990s.
2. Between 2000 and 2005, we estimate that over 120,000 new immigrants entered the labor force of the state at a time when the overall labor force was stagnant. However, in the absence of new immigrants, some employers might have hired more native born workers, especially teens and young adults, 20-24 years old. Findings on the employment rates of 16-24 year olds in recent years reveal that their employment rates were significantly reduced in the presence of a higher level of new immigrant workers, especially men with no substantive post-secondary schooling.
3. The annual average civilian labor force participation rate of the nation rose modestly during the economic boom years of the 1990s but then fell between 2000 and 2005, especially among males, teens, and young adults.
4. Since out-migration from states is self-selective and typically includes many persons with strong human capital skills and strong ties to the labor market, one might have expected high levels of out-migration to be associated with declines in labor force participation via the brain drain effect.
5. For a review of comparative labor costs in Massachusetts, *See*: Andrew Sum, Ishwar Khatiwada, Joseph McLaughlin and Paulo Tobar with Sheila Palma, *The Cost of Labor in Massachusetts, Research and Evaluation Briefs*, Commonwealth Corporation, Boston, April 2006.
6. "Still a Housing Crunch, *The Boston Sunday Globe*, August 13, 2006, p. D-8.

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